Sterilizing with sound: Research offers a new method

John Toon
Research News and Publications

A n acoustic phenomenon previously studied for its effects on submarines could be the basis for an improved disinfection technique able to rapidly kill microorganisms on medical instruments without high temperatures or harsh chemicals.

Preliminary studies by scientists at Georgia Tech and Georgia State University showed the technique killed more than 90 percent of bacteria in a test vial that also contained a mild solution of isopropyl alcohol, the main ingredient in rubbing alcohol. Results of the work were presented December 5 at the First Pan-American/Iberian Meeting on Acoustics in Cancun, Mexico.

Cunefare to develop the technique. “We believe that our methods will sterilize in shorter periods of time, which would be a substantial advantage for expensive medical equipment.”

The patented technique uses a form of cavitation, a phenomenon in which acoustic energy applied to a liquid induces the creation of voids — or bubbles — that release energy when they collapse. By pressurizing their test chamber while inducing cavitation, Cunefare and Carter created a form of transient cavitation that causes violent collapse of the bubbles.

When applied to a solution of 66 percent isopropyl alcohol containing two forms of “marker” bacterial spores — Bacillus stearothermophilus and Bacillus subtilis — the enhanced cavitation reduced the bacterial count by more than 90 percent, Cunefare said. Research indicates that both the alcohol solution and increased pressure are necessary for killing the spores with cavitation.

Tests showed little effect on the spores from the transient cavitation in plain water, or from cavitation of the alcohol solution at standard atmospheric pressure.

Because acoustic disinfection could be carried out more quickly than existing heat and chemical techniques, Carter believes it could offer significant cost advantages by reducing the amount of time that expensive equipment is out of service. And it would also have the potential for minimizing the risk of cross-transmission of infection caused by contaminated instruments, he added.

The germination

The idea for using transient cavitation to disinfect instruments originated with Carter, who had been interested in a new approach for sterilizing the growing number of instruments that are vulnerable to damage from traditional heat disinfection. He reasoned that rapid decompression might be able to kill microbes by breaking their cell walls, and obtained a patent for the idea in 1994.

Subsequent testing, however, showed that even “explosive decompression” failed to kill the hardest of

Weekend events offer new social atmosphere for students

David Terraso
Institute Communications and Public Affairs

A pproximately 5,000 students turned out last fall to attend Ramblin’ Nights, prompting Dean of Students Gail DiSabatino to announce that the five-night series of events will return next fall, provided that enough funding can be found.

Ramblin’ Nights was started last semester by DiSabatino’s office to build community on campus by boosting Tech’s traditionally quiet nightlife. Held from 10 p.m. to 2 a.m. most Friday nights before home football games, each Ramblin’ Night was hosted by a different campus office at different venues. Featuring live music, free food and activities ranging from an oxygen bar to a henna tattoo stand, the events were basically a late night campus party — alcohol-free, of course.

“Ramblin’ Nights, as a whole, was a huge success,” said DiSabatino. “There was a great diversity of activities, so it appealed to various segments of our student body. The goal was to build community and school spirit while providing students with an alternative to alcohol-focused activities. There is no question we achieved our goal.”

Getting the various campus units hosting the events to work together and securing the funding promised to be two of the biggest challenges to Ramblin’ Nights’ success, not to mention getting students to actually show up for the party. So, DiSabatino worked on raising the money and enlisted the help of GT SMART, Tech’s
"QUOTE-UNQUOTE"

"An agreed-upon system to assess what the river can do can be a solid basis for communication and an opportunity to peacefully resolve differences."

—Aris Georgakakos, professor in the School of Civil and Environmental Engineering and director of the Georgia Water Resources Institute, on developing computer-based models to determine the most effective water management strategies for 10 African countries supported by the Nile River.

(Atlanta Journal-Constitution)

"It's going to be up to the individual (job seeker) whether they try it or not. If it's a long shot anyway, then why not take a chance and do something a little creative, something that might get the attention of someone? If you're trying to stand out among the crowd, doing something that does indeed stand out, may improve your chances."

—Ralph Nobile, director of Career Services, on locating the "rules" of resume writing.

(Atlanta Journal-Constitution)

Baseball team chosen as preseason favorite

For the second time in three years and for the third time in 10 seasons under head coach Danny Hall, the Georgia Tech baseball team is ranked No. 1 in the nation in Baseball America's preseason Top 25 poll. Four Yellow Jackets — pitcher Kyle Bakker, outfielder Matt Burton, second baseman Eric Patterson and outfielder Jeremy Slayden — were named to the publication's preseason all-America team that was selected by Major League scouting directors.

"Any time you get this kind of recognition, it says a lot about what your program has accomplished," said Hall, who has a 396-172 record in nine years at Tech, including two trips to the College World Series (1994 and 2002). "We are excited about the upcoming season, and we are looking forward to playing for a chance to get back to Omaha and the College World Series.

"At the same time, we realize that it is called the preseason poll for a reason. We still have to work hard to reach our goals. But we are honored to be held in this high regard for what our program and our players have accomplished."

Georgia Tech led all schools with four players on the preseason all-America team. Bakker and Burton, a pair of juniors who are considered excellent prospects for the 2005 Major League Baseball amateur draft, were both named to the first-team preseason all-America team. Bakker went 13-2 with a 3.14 ERA as the ace of Tech's pitching staff last year. Burton hit .344 with 10 home runs in 2002.

Patterson and Slayden, a duo of sophomores who both earned freshman all-America honors last spring, were named to the second-team preseason all-America team.

"All four of those guys — Kyle Bakker, Matt Burton, Eric Patterson and Jeremy Slayden — are very deserving of the preseason recognition," said Hall. "They have had great seasons for us and have opened a lot of eyes with their play for their summer teams. At the same time, I think that we have some other guys who were left off that list that I hope end up on the postseason all-America teams."

WHISTLE

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organization for reducing high-risk drinking, to organize the events and get the word out to students.

President Wayne Clough allotted the first gift, while DiSabatino raised the rest. Private companies such as the Eastman Kodak Company and the Coca-Cola Company, along with other campus units, offered in-kind donations. Local businesses offered prizes, including free round-trip airline tickets. DiSabatino also asked the Ahami Association, the Athletic Association, the Student Athletic Complex, the Student Center Programs Board and the Residence Hall Association to each host a night. The partnership worked. Each Ramblin' Night averaged approximately 1,000 students, and a survey sent out to students after the fourth event showed that 95 percent of the respondents felt that the night met or exceeded their expectations. That's compared with a 54 percent favorable rating from the first night.

"We definitely learned a lot about what types of events the students are interested in. By the fourth night we had students lined up past closing time for the oxygen bar and the henna tattoo artist," said Sherry Crawley, communications specialist for GT SMART and a principal organizer of the events.

As it turned out, having a different campus unit organize each night ensured the attractions maintained the diversity needed to keep students interested. From Casino Night at SAC to hypnotism and comedy, each night was vastly different from the previous one.

Whether the fall semester will see a Ramblin' Nights II depends largely on economics. It's expensive to put on events and provide food for all those students. And the more popular the events get, the more expensive they become. DiSabatino has ruled out charging admission to help defray the costs, so that means the money has to come from donations.

"We have high hopes for having this again in the fall. The student interest was overwhelming. I think they would be very disappointed if it was not offered again," said DiSabatino.

For more information:
Division of Student Affair
www.studentaffairs.gatech.edu
College of Engineering challenged by dean

Michael Hagearty
Institute Communications
and Public Affairs

In his first major faculty address since taking the reins at the College of Engineering, Dean Doris Giddens set a tone emphasizing responsibility and cooperation, and challenged the audience — including several who watched via videolink from the GTREP campus in Savannah — to use the resources at hand to improve its stature among top research universities.

Working from a slide presentation, Giddens first showed how Tech stacked up against other premier engineering universities. Currently, Tech leads the nation in the number of degrees it awards.

"We're a big player in engineering education," he said, "which means we have a big responsibility" to not only maintain, but also look for ways to enhance the College's reputation nationwide.

Among other things, improvement can be made in how the College is perceived, both by deans at peer institutions and among recruiters. Some of that will come, he added, with greater representation in the National Academy of Engineering, an issue for which he has formed a review committee.

Giddens said he believes the strengths of the College — its quality, collegiality and serve — will also serve some of its strategic themes, namely undergraduate learning, interdisciplinary research and an effort to bring greater diversity into its ranks.

He also expressed an interest in receiving greater input from faculty with regards to policy decisions. To that end, he announced the formation of the Dean's Faculty Advisory Council, with representatives from each of the 9 schools, to generate ideas and communicate the suggestions of others. In identifying opportunities for improvement, Giddens stressed the desire for all faculty members to express themselves on issues pertaining to the College.

A review of the College’s Strategic Plan, last minted in 2000, is also planned.

Chancellor assesses System after his first year

In his first “State of the System” address to the University System of Georgia’s Board of Regents, Chancellor Tim Shull, cited leadership, good partnerships and strong public support as critical factors in the continued growth and progress of the System’s 34 institutions.

Having now served as chancellor for a full year, Meredith pledged that the System’s 34 institutions will continue, and demands on academic programs and facilities will thus increase. We will need to be innovative in meeting this demand.

"We are thrilled to be recognized in this way, particularly when you look at the caliber of competition," said ATRF Director Craig Wycill. "Yet, we are not surprised, given the unique nature of our program and its pioneering efforts to bring new technology innovation to the industry."

Give blood

The dates for the Georgia Blood Drive — sponsored by the Co-op Club, the MOVE Office and the American Red Cross — are set from 10 a.m. – 4 p.m., Jan. 21 – Jan. 23 in the Student Center Ballroom. Donors are advised to allot up to 90 minutes to give blood; however, it should only take one hour if given earlier in the day.

If you have any questions about your eligibility to give blood, call 1-800-GIVE LITE. For those with questions about the Georgia Tech Blood Drive or to make an appointment to give blood, call the MOVE office at 404-894-2002 or e-mail move@gatech.edu.

Research program in Taiwan

The Manufacturing Education Program (MEP) at Georgia Tech, the educational arm of the Manufacturing Research Center, has been awarded funding from the National Science Foundation (NSF) for a Summer 2003 Sponsored Research Program in Taiwan.

In June, the first week will be an orientation and introduction to language, culture and research policy, as well as other activities. Approximately seven weeks will be spent on research activities at the host institution in Taiwan. Students accepted for the program will receive a round-trip air fare, living expenses and a stipend of $2,500.

The deadline for applications is Monday, January 20. To be eligible for the program, students must be U.S. citizens or permanent residents and currently enrolled in any of the engineering schools at the graduate level. For a program application form, email pam.rountree@marc.gatech.edu. Application forms must be submitted to Steven.liang@me.gatech.edu.

IN BRIEF:

Accreditation forms online

Georgia Tech’s accreditation forms will soon be accessible online, creating a uniform way to report data that is required to submit to the Institute’s accreditation review. As part of its features, the on-line system will provide a history of the Institute’s accreditation, allow users to generate limited reports, and track the progress of the review as opposed to following paper trails.

Office of Information Technology (OIT) Director John Mullin is currently serving on a committee that is focusing on compliance in relation to the accreditation process. The OIT team assisting with the new online forms consists of Debbie Bradshaw, Andy Fox, Steve Giddens, Sharpe, and Jason Tothe, all with the Enterprise Information Systems department.

Another top 10 ranking for Tech

The Agricultural Technology Research Program (ATRF) at Georgia Tech is among the top 10 university programs serving the meat and poultry industry, according to an industry survey conducted by Meat and Poultry magazine. ATRF is based at the Georgia Tech Research Institute.

ATRF earned Tech a number 10 ranking, and was awarded $500,000 for developing innovative poultry processing technologies and successfully taking them from the drawing board to commercial applications.

"We are thrilled to be recognized in this way, particularly when you look at the caliber of competition," said ATRF Director Craig Wycill. "Yet, we are not surprised, given the unique nature of our program and its pioneering efforts to bring new technology innovation to the industry."

IN BRIEF:
CLASSIFIEDS

Articles & Culture
Jan. 18
The American Museum of Papermaking hosts a workshop on “Traditional Japanese Bookbinding Techniques” with Lynn Sures, from 1-4 p.m. at the Institute of Paper Science and Technology. For more information, call 894-6663.

Brown Bags/Lectures/Faculties
Jan. 16
The College of Computing’s Distinguished Lecture Series continues with Allan Fisher, president and CEO of iCarnegie, on “Unlocking the Clubhouse: Women in Computing” at 3 p.m. in room 117, Student Services Building. Co-sponsored by the Center for the Study of Women, Science and Technology as part of the WST Honored Speaker Series. For more information, call 894-3153.

Jan. 17
The Program in Cognitive Science’s Colloquium series welcomes Carnegie Mellon University Professor Manuela Veloso on “Coordination of Autonomous Robot Teams” at noon in the MaRC auditorium. For more information, call 894-7865 or e-mail mark.baran@icpa.gatech.edu.

Computers
Jan. 22
The Office of Organizational Development offers a five-day course in “Fundamentals of Good Leadership,” beginning at 8:30 a.m. in the Ballroom at the Alumni House. To register, refer to www.trainweb.gatech.edu or call 894-2249.

Jan. 19
Georgia Tech will hold its annual King Week Ecumenical Service at 10 a.m with keynote speaker at noon in the MaRC auditorium. For more information, call 894-3070.

Jan. 20
Technomasters — Tech’s chapter of Toastmasters International for faculty, staff and alumni — meets every Thursday from 7:30-9 a.m. in room 102 of the Microelectronics Research Center. For more information, e-mail edgar.jones@ece.gatech.edu.

Ongoing

Technology as part of the WST Honored Speaker Series continues with Allan Fisher, president and CEO of iCarnegie, on “Unlocking the Clubhouse: Women in Computing” at 3 p.m. in room 117, Student Services Building. Co-sponsored by the Center for the Study of Women, Science and Technology as part of the WST Honored Speaker Series. For more information, call 894-3153.

Appliances
1995 Jeep Cherokee Sport. Black, tan, automatic, CD, extra clean. All mainte- nance records. 113K miles, granite (almost black), brown leather seats, automatic, CD, extra clean. All mainte- nance records. 45K miles, excellent condition, $5,400. Call Jane at 894-7710 or e-mail melodieke@attbi.com.

Automobiles


1994 Ford F-150 4x4. Black, auto, power everything, a/c, cruise, cassette, alarm, wheels, 147K hwy miles, $5,000. E-mail david.durfee@icpa.gatech.edu or call 894-7683.

1995 Chevrolet Astro Luxury van. Teal w/beige interior, excellent condition, 1 owner, 113K, 7-passen- gers, power windows, power door locks, tilt wheel, cruise, CD player, rear air, $5,500. E-mail john.white@icpa.gatech.edu.


1996 Nissan Maxima GXE. 4-door sedan, granite (almost black), automatic, 97K, excellent condition, regu- larly serviced by authorized dealer, $5,500. Call 894-1720.

1999 Subaru Impreza Rally Sport. Blue, excellent condition, 46K miles, AWD, sunroof, alarm/keyless entry, 6-disc CD, climate control, $12,500. Call Greg Hite at 878-5217-7110 or e-mail durelen@mindspring.com.

Maiza Special Edition, 6-speed with overdrive, British racing green, tan top & interior, 2,900 miles. Bose premium audio system. Call 404-840-7593 or e-mail ximena@alum.mit.edu.

Computers
IP Phone/Photofiltre 110 printer. SmartMedia and Compact Flash card readers. Extra black ink cartridges. $125.00. E-mail chris.simkins@grtl.gatech.edu or call 385-2590.

Dell Dimension 4100, 850MHz. Windows 2000 Professional, 40 GB hard drive, 384MB Memory, 12X DVD- ROM, 8x4x16/S2 CD-RW, 17 Trinitron excellent speaker system and sub-woofer, $650. Call 894-7052 or e-mail christopher.head@icpa.gatech.edu.

Furniture
Rear glass-top kitchen table set with four white slicker chairs, comes with covered cushions and matching stand. $175. Photo available. E-mail mark.barbour@icpa.gatech.edu.

Spacious computer desk. L-shaped corner desk with monitor stand and CD storage. Faux wood finish on desktop; black faux granite finish. $75. We have two! Call 894-7688 or e-mail pnescweb@bellSouth.net.

Two queen-size rollaway folding beds. Excellent shape and high quality, $75 each. Entertainment center, oak, natur- al finish. Can hold 36” TV, $400. Contact Richard at 894-2682 or e-mail rc7@prism.gatech.edu.

3-piece entertainment center, white- washed pine finish, lightweight glass shelves. Center armoire holds up to 32” TV and other components. $600 OBO. Pictures available. E-mail deblieb@icpa.gatech.edu.

Real Estate/Roommates
2BR/2BA garden-style, spacious condo for sale, $159,900. Gated community. Atlanta skyline from large balcony. W/D, gas fireplace, pool and much more. 5 minute drive to GT. Email richard.matthews@attbi.com or hong-melodie@attbi.com.

38/28/2BA home for rent, great Buckhead neighborhood, tree-lined street overlooks golf course. 4 miles from Tech, <2000 sq. ft., renovated, new appliances, 1/19/00 month. Call Ed, 404-229-7385.

Sports/Fitness/Recreation
Northfields Gold Strength Training System with butterfly attachment and training points. Good condition. $500. Makes a great gift. Call Jack at 894-8191 or e-mail jack.woold@gtri.gatech.edu.

Miscellaneous
Free puppy, five months old, dark brown/beige mix. All shots current. Good as only pet or home with a child. Call 770-322-2725.

1995 Fleetwood Singlewide mobile home. 38/28/2BA, Jacuzzi/W/D con- nection; a/c. Asking $17,000. Call Denise at 404-762-5124.

Dexon 6-1 CD player, $35. E-mail richard.howell@icpa.gatech.edu or call 404-675-1829.

Wanted dog for 4-6 mos. old female calico. Call 894-4771 or e-mail kds25@prism.gatech.edu.

Custom built, all-brick ranch with in- law suite and pool on 1+ acres in Conyers. 3BR, 5.5/8, large office garage w/third door, hardwoods and Berber carpet. Asking $294,900. Call 894-5532 for photo.

Home for sale in Henry County. 3BR/2BA, family room, gas fireplace, two-car garage, split-level ranch on 57 acres. New carpet, paint and a/c. unit, $157,000 neg. Call Bob at 894- 5677.

3-4BR/2BA home for rent, great Buckhead neighborhood, tree-lined street overlooks golf course. 4 miles from Tech, <2000 sq. ft., renovated, new appliances, 1/19/00 month. Call Ed, 404-229-7385.

For more information, call 894-3070.