



Yellow Jackets: Highly Social Little Stingers

VICTOR ROGERS
INSTITUTE COMMUNICATIONS

Fall is yellow jacket season. Not football or basketball, but the time of year when colonies of yellow jackets — the insects — reach their maximum size. It's also when Professor Michael Goodisman and the Goodisman Research Group collect their nests.

"We typically collect nests for a month or so beginning in late October, which is prime time for collecting. The colonies usually die off around Thanksgiving, and are completely dead by Christmas — although climate change may be moving the dates," said Goodisman, associate professor and associate chair for Undergraduate Education in the School of Biological Sciences.

Humans usually cross paths with the yellow jackets' underground nests a couple of times a year. The first is between April and June, when people tend to mow their lawns frequently. The second is fall, when it's time



Above photo by Rob Felt // Below photo courtesy of Michael Goodisman

(Above) A yellow jacket nest retrieved for research in Goodisman's lab. (Below) Eric Hoffman, former postdoctoral fellow in Goodisman's lab, and Goodisman are pictured in safety gear worn for retrieving yellow jacket nests.

to rake leaves.

"Yellow jackets are particularly aggressive this time of year," said Goodisman, whose team collects the insects alive, albeit somewhat sedated. The underground nests typically have a single hole, about the size of a silver dollar, for entering and exiting.

"We pour a little bit of

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Campus Recreation Center Hosts USA Swimming Events Next Week

MORGAN MILLER
CAMPUS SERVICES

Next week, the Campus Recreation Center (CRC) will host the Toyota U.S. Open Championships and the 2019 Speedo Winter Junior Championships. These USA Swimming sanctioned competitions will bring national and international professional swimmers to campus.

Throughout the competitions, parts of the CRC and McAuley Aquatic Center will be closed. The fitness floor and upper track and courts will remain open to CRC patrons. The campus community should expect pedestrian and vehicular traffic throughout both events, which begin Wednesday, Dec. 4.

Event tickets are available for \$3–\$25



Photo by Rob Felt

using a GTID number for purchase. Visit crc.gatech.edu/usopen for more information.

Full Closure Information

- The McAuley Aquatic Center will be closed to recreational swim patrons from Dec. 3–15
- Aquatic locker rooms and restroom

areas will be closed Dec. 3–14.

- The Crawford Leisure Pool will have intermittent closures Dec. 1–14.
- The CRC First Floor Family Restrooms and Sauna will close Dec. 4–7.

Related Information

- Only credentialed personnel are permitted within the McAuley Aquatic Center Pool Deck, first floor corridor, and adjacent rooms from Dec. 4–14.
- Exiting the CRC from the first floor will not be permitted from Dec. 3–14. Patrons can use the main entrance/exit or second floor corridor/stairs to the CRC-W10 parking deck.

Tech Places First in Atlanta Bike Challenge

KRISTEN BAILEY
INSTITUTE COMMUNICATIONS

Each October, Georgia Commute Options sponsors the Atlanta Bike Challenge, a chance for cyclists of all levels to hit the road on two wheels and encourage others to do the same. The challenge allows riders to form teams and compete against other workplaces for who can log the most miles and get new cyclists to join.

This year, a slew of Tech employees did just that. Overall, Georgia Tech placed first out of 67 organizations with 500+ staff, and first overall out of nearly 300 organizations that participated in the Challenge.

In total, Tech employees biked 22,300 miles, with more than 9,300 of them serving as part of a commute. The collective efforts prevented more than 7,400 pounds of carbon dioxide emissions.

"Encouraging others to ride cannot be limited to the Challenge, as increasing the number of people who ride not only reduces congestion on our campus roads and improves the quality of air we breathe, but also helps to make the roads safer for all of us," said Becky James, instructor at the Campus Recreation Center who helped captain the challenge for Georgia Tech.

A group from the Georgia Tech Research Institute (GTRI) took home first place among teams from Georgia Tech. The members of team "GTRI's Thighs" biked 5,166 of Georgia Tech's total miles.

Jett Marks, a research scientist in GTRI's CIPHER lab, was among the leaders on that team. When Marks joined GTRI in 2015, he was elated to find others who shared his love for biking — for fun, for a commute, or both. He had participated in the Atlanta Bike Challenge in the past and became a catalyst in getting others within GTRI to participate.

The Challenge "game-ifies" cycling by awarding points for daily riding, number of miles, and encouraging others to join. For Marks, encouraging

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NEWS BRIEFS



Track and Field Coach Named to Olympic Staff

Georgia Tech track and field assistant coach Nat Page has been named to Team USA Track and Field's coaching staff for the 2020 Tokyo Olympics. Page is in his 24th year coaching at Georgia Tech.

ramblinwreck.com



Tech Earns Primetime Football Win

The Jackets bested NC State at home Thursday, Nov. 21, in their last ACC matchup of the season. Tech hosts the University of Georgia at Bobby Dodd Stadium Saturday, Nov. 30, at noon.

ramblinwreck.com



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EVENTS

ARTS AND CULTURE

Dec. 3
The Georgia Tech Jazz Ensembles present their final fall concert from 7:30 to 9 p.m. in the West Village Concert Hall.
music.gatech.edu

Through Dec. 31
The Astounding Elements exhibit will be on display in Crosland Tower, featuring chemical elements in fiction and highlighting objects from Georgia Tech periodic table events throughout the year.
periodictable.gatech.edu

WORKSHOPS AND TRAINING

Dec. 2
The End Suicide initiative hosts a Question, Persuade, Refer (QPR) Training from 3 to 5 p.m. in Room 117, Smithgall Student Services (Flag) Building. Register at:
endsuicide.gatech.edu

Dec. 11
The End Suicide initiative hosts a Question, Persuade, Refer (QPR) Training from noon to 2 p.m. in the Living Learning Community West Commons, Room 210, Curran Building. Register at:
endsuicide.gatech.edu

Jan. 10, 2020
Student Diversity Programs hosts a Multicultural Competence 101 brown bag from noon to 2 p.m. in Room 301, Student Center.
diversityprograms.gatech.edu

MISCELLANEOUS

Nov. 27-29
Classes will not meet. Campus will close for the Thanksgiving holiday Nov. 28-29.

Nov. 30
Georgia Tech football hosts the University of Georgia at Bobby Dodd Stadium at noon.
ramblinwreck.com

Dec. 2
A Strategic Plan visioning session will take place from 10 to 11:30 a.m. in the Student Center Ballroom. This session is open to all of campus.
strategicplan.gatech.edu

Dec. 3
A Strategic Plan visioning session will take place from noon to 1 p.m. in Press Rooms A and B, Bill Moore Student Success Center. This session is open to all of campus.
strategicplan.gatech.edu

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anesthetic into the hole. It does the same thing to them that it does to us — it knocks them out,” Goodisman said. “Then we try to dig up the nest very quickly before they come to. We pull the nest out and bring it back to the lab.”

When collecting nests, Goodisman and the team wear beekeepers’ uniforms with long pants underneath for additional protection. Yellow jackets are aggressive and will push their way through air holes in the pith helmets, so the researchers cover them with tape to keep the insects out.

“I have had that happen to me, and it’s no fun at all!” said Goodisman. “If there’s an opening, they will find it and get in.”

Studying Yellow Jacket Behavior

The Goodisman Research Group is studying yellow jackets to learn about highly social behavior.

“Yellow jackets are an example of some of the most extreme and impressive social behavior that you will see in any animal, even more so than in humans,” Goodisman said. “Their social structure is similar to honeybees in that they typically have a single queen, though not always. She produces a bunch of selfless workers that work until the colony succeeds.”

The researchers are also interested in studying multiyear super colonies. Nests usually last only one season, from May to December. But when temperatures are mild, a colony can survive the winter and become massive the next year.

“We have seen this in New Zealand, Australia, and South Africa. We’re starting to see it in Florida, South Alabama, and California — super colonies the size of a car,” Goodisman said.

These changes bring up other questions, such as, are yellow jackets facing the same environmental threats as honeybees?

“The short answer is we don’t know. There’s no one studying yellow jackets the same way they’re studying honeybees,” Goodisman said. “But not all of the things that affect honeybees will affect yellow jackets.”

Honeybees have been partially domesticated and bred for successful pollina-



Photo by Rob Felt

Yellow jackets exhibit extreme social behavior and are particularly aggressive in the fall season.

tion, reduced aggression, and increased honey production. Unfortunately, domestication often has unwanted side effects. For example, domesticated honeybees may display fewer behavioral defenses against parasites than feral honeybees as a consequence of the domestication process.

“Yellow jackets don’t really have that. We don’t associate yellow jackets with having a lot of diseases. They still could be subjected to pesticides, but it’s not really known,” Goodisman said.

It’s hard to tell if there has been a decrease in the yellow jacket population based on the calls the Goodisman Research Group receives.

“There has been no systematic survey that I know of,” he said. “I think a widespread survey over many years would be interesting.”

Go (Yellow) Jackets!

Goodisman’s interest in insects began when he was a child in Syracuse, New York.

“There are yellow jackets in Syracuse and all across North America, from Mexico to Alaska,” he said — indeed, they can be found all across the northern hemisphere. They are one of the most common and successful social insects.

“They’re great fun, as you might imagine. They have a lot of personality,” he said. “It’s exhilarating when you’re trying

to pull them out of the ground or get them out of the house.”

His undergraduate research at Cornell University included work with insects, and he did his doctoral thesis at the University of Georgia on fire ants.

While at UGA he saw fire ants in a tray in the lab, and he thought it was “so cool.” But his work with yellow jackets didn’t start until he did postdoctoral work in Australia.

“There was some interesting research being done on invasive yellow jackets in Australia and New Zealand. I’ve been working on yellow jackets well before I came to Georgia Tech.”

It was purely coincidental that Goodisman became a professor at Georgia Tech, home of the Yellow Jackets. But it still causes the occasional raised eyebrow when he tells people about his research.

“People do a double take and ask if I’m at Tech because of my yellow jacket research. They ask if I have a yellow jacket professorship, or if I’m the ‘Chair of Yellow Jacket Research.’ It’s always a fun conversation, especially with Georgia Tech alumni.”

Editor’s Note: For the past several years, Goodisman has promoted free yellow jacket nest removal through this publication. Nests are used in his team’s research. Email michael.goodisman@biology.gatech.edu to arrange pickup.

In Memoriam
John Bartholdi III
1947 – 2019

John Bartholdi III, Manhattan Associates/Dabbieri Chair and professor in the H. Milton Stewart School of Industrial and Systems Engineering (ISyE) and co-executive director of the Georgia Tech Panama Logistics Innovation and Research Center, died Tuesday, Oct. 29. Bartholdi was a respected ISyE faculty member who made important contributions to the supply chain field, particularly in warehousing and logistics.

“John Bartholdi was a valued colleague and friend,” said ISyE School Chair Edwin Romeijn. “He made substantial contributions to his field, to ISyE, and to the Institute as the co-director of Georgia Tech Panama. Our sincerest condolences go out to John’s family, friends, and students. He will be missed.”



Bartholdi earned his bachelor’s degree in mathematics from the University of Florida in 1968 and then completed two tours of duty in southeast Asia as a paratrooper in a Naval Special Warfare unit. He returned to the University of Florida to pursue a doctoral degree in operations research, which he completed in 1977.

Upon joining ISyE in 1980, he quickly established himself as a nimble researcher, capable of identifying creative, elegantly simple solutions to challenging warehousing and logistics problems. One of Bartholdi’s most famous warehousing solutions is the so-called bucket brigade, which offers an innovative method of self-organizing order-picking for warehouse workers and has been implemented in major global distribution centers.

As co-director of the Georgia Tech Panama Logistics Innovation and Research Center, Bartholdi applied his expertise toward Panama’s logistical challenges, with the goal of making the country the trade hub of the Americas. In 2015, the Ministry of the Presidency designated Georgia Tech Panama as the technical arm of the Logistics Cabinet.

Bartholdi’s research interests were wide-ranging. He analyzed voting systems to determine how difficult it actually is to manipulate election results. He devised a low-technology routing system for Meals on Wheels using space-filling curves. He also turned his professional expertise toward a personal interest: good food and wine. He eventually helped establish the Wine Supply Chain Council (now the Wine and Food Supply Chain Council), which comprises “a group of supply chain researchers dedicated to improving international supply chains for wine.”

Read more about Bartholdi and remembrances from his colleagues at isye.gatech.edu/news.

FACULTY AND STAFF
ACHIEVEMENTS

Lynn Fountain, principal research scientist with the Georgia Tech Research Institute, was selected as the Non-Profit Educational Institution Woman of the Year by the Women in Technology organization. The organization is committed to empowering girls and women to excel in science, technology, engineering, the arts, and math.

Pinar Keskinocack, ADVANCE Professor and William C. George Chair in the H. Milton Stewart School of Industrial and Systems Engineering, was installed as president of the Institute for Operations Research and the Management Sciences (INFORMS) at the group's annual conference.

David McDowell, Carter N. Paden Jr. Distinguished Chair in Metals Processing, Regents Professor, and executive director of the Institute for Materials, was named a fellow of the Minerals, Metals, and Materials Society. The honor recognizes outstanding contributions to the practice of metallurgy, materials science, and technology.

Ajeet Rohatgi has been named as a recipient of the 2019 Distinguished Alumnus Award from the Indian Institute of Technology (IIT) Kanpur, located in the Indian state of Uttar Pradesh. This award is the highest given by IIT Kanpur to its alumni in recognition of their achievements. Rohatgi is a Regents Professor in the School of Electrical and Computer Engineering, holds the John H. Weitnauer Jr. Chair in the College of Engineering, and is a Georgia Research Alliance Eminent Scholar.

Preet Singh, professor and associate chair of Graduate Studies in the School of Materials Science and Engineering, has been selected to receive the 2019 Engineering Division Technical Award and Beloit Prize from TAPPI. The award was presented at the Pulping, Engineering, Environmental, Recycling and Sustainability Conference in October.

COMMENCEMENT IS COMING



Photo by Allison Carter

David McDowell carries the mace during the Spring Master's Commencement ceremony. McDowell will serve as guest speaker at this semester's Ph.D. ceremony.

Mark your calendars for graduation festivities coming to campus in just two weeks.

Complete event information is available at commencement.gatech.edu.



Ph.D. Ceremony

Friday, Dec. 13
9 to 10:30 a.m.
McCamish Pavilion

Speaker: David McDowell, Distinguished Professor and the Carter N. Paden Jr. Distinguished Chair in Metals Processing
Doors open at 8 a.m.
No tickets are required for this event.



Master's Ceremony

Friday, Dec. 13
3 to 5:30 p.m.
McCamish Pavilion

Speaker: Ted Colbert, executive vice president of the Boeing Company and president and chief executive officer of Boeing Global Services
Doors open at 1:30 p.m.
No tickets are required for this event.



President's Graduation Celebration

Friday, Dec. 13
11 a.m. to 1 p.m.
Student Center Ballroom

Free to attend for all graduates and their families and guests.



Bachelor's Ceremony

Saturday, Dec. 14
9 to 11:30 a.m.
McCamish Pavilion

Speaker: Steven Denning, chairman of General Atlantic and advisory board member of Starr Companies
Doors open at 7:30 a.m. Tickets are required.

BIKE, from page 1

others to take up cycling comes naturally. "Outside of riding a bicycle, I've not found any other single act that brings so much positivity in so many ways," he said. "Riding a bike obviously trains our physical muscles, and it also trains our smile muscles."

Joshua Forester, who also works in the CIPHER lab, was the top rider overall for Georgia Tech, and a member of GTRI's Thighs. Forester bikes for commuting and fun, and recently completed a bike race in Fiji. He blogged about the experience of this year's Challenge and some of the activities that took place that month, including a trip from Georgia to Alabama along the Silver Comet Trail. Forester had a goal of being a top 10 rider during the challenge, and he biked nearly 900 miles in 10 days to meet that goal.

"I had to work through knee pain, some mild tennis elbow, a family emergency, rain and lightning storms, extreme fatigue from the exercise and sleeplessness, sickness, and vertebrae bruising from storing my headlight battery pack (which is itself padded) in my center jersey pocket and not realizing what was causing it until the final day," he wrote. "Some much-needed rest was in order."

Though the Challenge is over, Georgia Tech offers many resources for cyclists year-round.



Photo courtesy of GTRI's Thighs

Members of the GTRI's Thighs team (L-R): Jett Marks, Kit Plummer, Jason Bryan, Joshua Forester, Abby Perry, Josh Wells, and John Rose.

Some of those available from Parking and Transportation Services include a SmartPark permit (for occasional vehicular parking), helmet sales, and bike/scooter safety classes (in conjunction with the Georgia Tech Police Department and Bike GT). Georgia Commute Options offers ridematching, commuter

rewards, and guaranteed ride home programs. Many buildings are equipped with showers, and the new Dalney Parking Deck has Tech's first bike storage room outside of campus housing. Learn more at bike.hwb.gatech.edu.

The Georgia Tech Research Institute contributed to this story.

EVENTS

Dec. 4

Reading period will take place for the fall semester.

Dec. 5, 10

Reading period will take place for the fall semester from 8 a.m. to 2:20 p.m.

Dec. 5-12

Final exams will take place for fall semester.

Dec. 5

A Strategic Plan visioning session will take place from 6:15 to 7:15 a.m. in the O'Keefe Custodial Breakroom, Basement Level. This session is open to all of campus. strategicplan.gatech.edu

Dec. 5

A Strategic Plan visioning session will take place via webinar from 9 to 10 a.m. The webinar is open to all of campus. strategicplan.gatech.edu

Dec. 5

A Strategic Plan visioning session will take place from 11 a.m. to noon in the West Village Ensemble Room. This session is open to all of campus. strategicplan.gatech.edu

Dec. 5

A Strategic Plan visioning session will take place from 3 to 4 p.m. in the O'Keefe Custodial Breakroom, Basement Level. This session is open to all of campus. strategicplan.gatech.edu

Dec. 5

"Finding Resilience During the Holidays" will look at how to manage expectations during the holiday season. The event is hosted by the GRIOT and Resilience Employee Resource Groups from 3:30 to 5 p.m. in the Piedmont Room, Student Center. c.gatech.edu/ergs

Dec. 12

Students from the School of Industrial Design present their work at the Fall Launchpad event from 5:30 to 8:30 p.m. in the West Architecture Building. id.gatech.edu

Dec. 23-27

Campus is closed for winter break.

Jan. 1, 2020

Campus is closed for the New Year's Day holiday.

Jan. 3-10

Phase II Registration for the Spring 2020 semester. Phase II closes at 4 p.m. on Jan. 10. registrar.gatech.edu

Jan. 6

Classes begin for the Spring 2020 semester. registrar.gatech.edu

Jan. 20

Campus is closed in observance of the Martin Luther King Jr. holiday.

For a more comprehensive listing of events, or to add your own, visit calendar.gatech.edu.



Written by Victor Rogers // Photos by Rob Felt



Georgia Tech’s Office of Solid Waste Management and Recycling encourages and supports the Tech community in decreasing the amount of waste produced on campus and the amount of waste that the Institute contributes to landfills. The Office provides recycling services inside campus buildings, for fraternity and sorority houses, and at several outdoor locations across campus, and coordinates recycling for special events, office moves, the annual Earth Day Festival, student move-in and move-out, and home football games. Since 2008 Tech’s Game Day Recycling program has made it easy for fans to recycle, whether they are tailgating, walking on campus, or watching the game inside Bobby Dodd Stadium. In 2018, the Game Day program alone diverted nearly 17 tons of material from landfills. See more photos at c.gatech.edu/recycling.

(1) The East Main Recycling Center, located on Fifth Street next to the O’Keefe Building, is available for the campus and the greater Atlanta community to use. (2 and 3) In FY 2018 Georgia Tech recycled 7.31 tons of aluminum and 26.73 tons of plastic. (4) Emma Brodzik, campus recycling coordinator, assembles the desk-side AWARE (Actively Working to Achieve Resource Efficiency) bins for trash and recyclables. Employees are responsible for emptying their bin into the appropriate recycling containers in their building. (5) Shawn Dunham, foreman of the recycling crew, unlocks the gate at the East Main Recycling Center to allow trucks to service the bins.

Hidden Georgia Tech is a photo essay series highlighting places on campus that may largely go unnoticed but are sometimes hidden in plain sight. If you know of a place worth exploring, email editor@comm.gatech.edu.



CLASSIFIEDS

REAL ESTATE/ ROOMMATES

For rent: 1BR/1BA apt. in Home Park. Newly renovated. Off-street parking, W/D, water/sewer/ADT security incl. Lots of storage. \$1,300/mo. Available Jan. 2020. Contact charles.rudolph@design.gatech.edu.

Roommate wanted for new 2BR/2BA fully furnished basement apt. in W. Cobb near Marietta Square. Ideal for staff, student, or visiting scholar. \$800/mo., some utilities included. Available Dec. 1. Contact dlgray2000@yahoo.com, 770-687-8993.

3BR/2.5BA townhome off 14th and Holly St. Walking distance to Tech via path by Grad Housing and Turner. Two deeded parking spaces. View listing at <https://tinyurl.com/14th-nearGT>. Contact Maggie, 404-804-6405.

Short-term lease, furnished room for rent in Decatur area. Good commuting to Georgia Tech. Apt. shared with Georgia Tech faculty/staff. Ideal for visiting scholars or temporary stays. \$800/mo. Contact Javier, jpadilla8@gatech.edu.

For rent: 2BR/1BA apt. in Midtown. Reserved parking, washer/dryer in unit, Google fiber. 4 mi. from Tech. \$1,700/mo. (water/sewage included). 696 Argonne Ave NE. Contact mahajan@gatech.edu, 404-894-9156.

For rent: 2BR/2BA condo in Cross Creek. Morris Brandon School District. Updated, hardwood floors throughout, golf course view. No smoking, no pets. 4.1 mi. from Tech, no expressway driving. \$1,700/mo. 143 Elysian Way. Email fran.buser@isye.gatech.edu.

MISCELLANEOUS

For sale: Men’s road bike in excellent condition. Quasar Pacific model. 18 in. seat tube length. Original owner. \$50. Contact sn2@gatech.edu, 404-201-0948.

Interested in owning partial 2020 Braves season tickets (2 tickets)? Section 35: behind visitor dugout, aisle seats, \$104/ticket (list price). B11 parking option each game. Contact Aaron, aaron.fowler@gatech.edu.

Free yellow jacket nest removal. Nests to be used for research in the School of Biology. Email michael.goodisman@biology.gatech.edu to arrange pickup.

For sale: faux leather sectional and table. Black futon sofa bed couch w/ convertible chaise lounge. Great condition. \$200 OBO. Hand-crafted, modern hightop kitchen table. \$75. Contact Jasmine, 404-539-2918.

Large faux leather charcoal gray couch for sale. Excellent condition. \$150. Contact Rhonda, 404-455-4646.

Table and chairs for sale. Round, modern glass table w/ 4 white leather chairs. \$200 OBO. Excellent condition, practically brand new. Contact Rhonda, 404-455-4646.

VEHICLES

2007 Honda CBR 1000RR 9k ml. Original owner, garage-kept, showroom condition, all maintenance done. Chrome wheels, tinted windscreen. \$6,500. No trades. Serious cash buyers only. Contact 404-590-5692.

Ads run for at least three issues in the order in which they are received. Submit your 35-word-or-less ad to editor@comm.gatech.edu.