

## Congratulations:

- 65 student awarded President's Undergraduate Research Awards (PURAs) for Summer 2006
- Congratulations to Dr. Ashraf Saad, Associate Professor, Electrical and Computer Engineering, Georgia Tech Savannah, for his Award as Outstanding Faculty Undergraduate Research Mentor Award, Spring 2006

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Undergraduate Research Opportunities Program (UROP)  
Georgia Institute of Technology

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## Spring Undergraduate Research Poster Session

Georgia Tech's Undergraduate Research Opportunities Program (UROP) sponsored Georgia Tech's 1st Institute-wide Undergraduate Research Poster Session on April 20, 2006. Fifty-one students from 5 colleges participated in the event held at the Petit Biotechnology Building. Forty faculty and student judges evaluated posters for their excellence in appearance and research content, as well as the student's ability to discuss his/her work with non-experts in the field. One judge remarked that "This was fun!" when turning in her judging sheets. Several students commented that they enjoyed seeing research of fellow undergraduates from other areas

of campus.



*Dr. Sankar listens intently as Greg McCormick discusses his research*

Congratulations to our award winners:

**College of Architecture**—Top Poster: Matthew Swarts

**College of Computing**—Top Poster: Team: Aaron St. Clair, CS, and Dana Van Devender, CM

**Ivan Allen College**—Top Poster: Divya Kalb, INTA

**College of Sciences**—Top Poster – 2 winners (tie): - Nabil Wilf, Biology; Stephen Hsu, Physics

**College of Engineering**—Top Poster – 3 winners (tie): Greg McCormick, AE; Shalini Bumb, BME; Rachna Kamath, ChBE; 2nd Place: Cornelia Moebes, ChBE; 3rd Place – 3 winners (tie): Shreya Shukla, BME; Team: Amin Rida and Franklin Falcon, EE; Tien Le, ChBE.

For a complete list of student participants, please visit [www.undergradresearch.gatech.edu](http://www.undergradresearch.gatech.edu)

## New Director of Undergraduate Research

Dr. Karen Harwell was named the Director of Undergraduate Research at Georgia Tech and began her new position on January 18, 2006. She will be responsible for implementation of the portions of the Institute's Quality Enhancement Plan (QEP) related to undergraduate research and building the Undergraduate Research Opportunities Program (UROP).

Karen came to Georgia Tech from the National Academies in Washington, DC, where she was Assistant Director of the Aeronautics

and Space Engineering Board.

While Karen's background is in aerospace engineering, she is excited about working with students and faculty from across campus to promote and enhance undergraduate research.



She is a Ph.D. graduate from North Carolina State University and a B.S. graduate from the University of Alabama. Some of her best memories from undergraduate school were the research projects performed as a student in the Computer Based Honors Program.

Karen enjoys traveling, reading, and playing handbells. Her door is open to any undergraduate student or faculty member who would like to discuss undergraduate research.

# Undergraduate Research News

## Faculty Profile: Dr. Amy Bruckman, Professor, COC



Arwa Tybekhan (R) explains her research to Amy Bruckman at the Spring 2006 UROC poster symposium

During graduate school at MIT, Amy Bruckman supervised a dozen undergraduate researchers. She didn't stop there. In addition to mentoring undergraduates in her lab now, Bruckman chairs the Georgia Tech Undergraduate Research Advisory Group (URAG) and has been instrumental in the development of the portion of the Institute's Quality Enhancement Plan (QEP) related to undergraduate research.

Bruckman commented that undergraduate researchers "form an incredibly important

part of my research efforts". Undergraduates in her lab are involved in every aspect of her work—coding, software design, and planning and conducting empirical studies of people using the software the research group has developed. She also stated enthusiastically that "a lab doesn't feel right without a dedicated group of undergrads working there."

When asked why she believes research is important, Bruckman commented that "Research gives students a chance to work on a totally new problem—one

that no one has ever tackled before. It's an intellectual challenge."

Bruckman founded the popular Undergraduate Research Opportunities in Computing (UROC) program. The program hosts a fall job fair at which students learn about research opportunities available, a spring research symposium sponsored by Intel where students present their work (and devour Krispy Kreme doughnuts!), and an on-line jobs database. She believes that the quality of undergraduate research improves each year.

## Student Profile: Angela Gill Bailey, BME

After taking a fall course with Dr. Barbara Boyan, an opportunity arose for Angela Bailey to begin undergraduate research. After working under an MD-PhD student her first semester, Bailey now supervises her own work and has even become the lab's expert on Polymerase Chain Reaction (PCR), teaching other students. The lab employs 2 faculty, around 10 graduate students, and 10-12 undergraduate students. Bailey says that

this atmosphere has allowed her to work on different aspects of one large research effort and has provided plenty of experience with teamwork. She has been awarded 2 President's Undergraduate Research Awards (PURA), worked for course credit, and as research assistant within her mentor's laboratory.

Bailey believes that students need more than just textbook experience—research is a great way to gain hands-on,

experience. As President of the student Biomedical Engineering Society (BMES) and a member of the student advisory board for BME, she has worked to raise awareness of the importance of undergraduate research. BMES sponsored information sessions in BME on undergraduate research and Bailey wrote her own "Top 10" List (see below).

A single mom of a 3 year old, Bailey plans to work on an MBA and then start her



own biomedical-related company helping bring together engineers, physicians, and product developers.

## Top 10 Reasons To Do Undergraduate Research\* By Angela Bailey



### 1. Be humble

Guess what...you do NOT know everything and those who have been doing research before you have A LOT to teach you.

### 2. Commit

Research takes time and energy so it is best to commit to more than one semester.

### 3. Have passion

Try to pick a lab doing re-

search in an area of interest to you.

### 4. Be responsible

Make and keep commitments, clean up after yourself, and keep your notebook up-to-date for your benefit and those whose research will follow yours.

### 5. Persevere

Science rarely, if ever, works the way you want it to the first

time. You will have to be creative and determined in order to be successful in any lab.

### 6. Be resourceful

Prepare to read scientific journal articles (NOT GOOGLE... unless you are using scholar.google.com). Talk to students and faculty in other labs doing similar research and learn from them.



## Student Profile: Michelle Tougas, Biology

Michelle Tougas is heading to Duke University for graduate school this fall. She credits her three years of work in undergraduate research for sparking this interest and providing a focused career direction.

After taking Biology 1510 from Dr. Nael McCarty, Tougas began working in his laboratory her first year at Georgia Tech. A couple months after she started work in Dr. McCarty's lab, Tougas was offered the opportunity to start her own project, working with G protein-coupled receptors (GPCRs). Mutations in

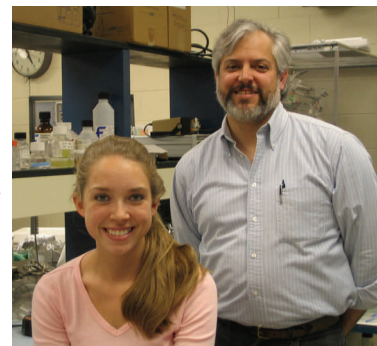
these receptors account for a wide array of genetic diseases— one being a target during HIV-1 infection. Tougas is studying the consequences of a newly discovered phenomenon known as heterodimerization in which two different receptors couple to form a single unit with unique properties.

Tougas's number one piece of advice for anyone considering research is to find an advisor that you can work well with. When speaking about her advisor, Tougas said, "He has poured hours of time and

effort into my development as a scientist and an individual, and I feel that I could not have had a better mentor. I'd like to nominate him for an award..."

Tougas also underscored the importance of researchers being able to discuss their work with others. Faculty should provide opportunities to practice this.

Tougas enjoys scuba diving, having explored wrecks in Panama City and the Adriatic Sea. She is from the Atlanta area and also enjoys cooking and working out.



## Faculty Profile: Dr. Jud Ready, Senior Research Engineer, GTRI

"It was my own experience as an undergrad researcher that led me to look to [undergraduate researchers]," stated Dr. Ready about his first involvement working with undergraduates in his laboratory at the Georgia Tech Research Institute (GTRI). Dr. Ready is a member of the Undergraduate Research Advisory Group (URAG) on campus and a senior research engineer at GTRI. His research involves work

with carbon nanotubes. Under his advisement undergraduates develop a hypothesis that can be tested in 15 weeks, conduct the experiment, and analyze the results. The students provide a written report of their work at the end of the semester, present to the research group, and develop a poster suitable for presenting at a professional conference. They also wash glassware, do inventory, and find materials at the

library on occasion. When asked the best way to find a research project, Ready simply said "Ask each professor you like if they have any job openings."

Ready believes that participating in undergraduate research is a benefit to the student. It helps students develop skills necessary for graduate school and provides good hands-on experience on a resume.

### 7. Mistakes...everyone makes them

Be honest about your mistakes, covering them up can create HUGE problems. Remember that honesty is the best character trait you have to offer.

### 8. Learn to be a team member

Your lab might be large and your project a tiny portion of the "big picture". Success

comes from listening and learning from other members of your team.

### 9. Build communication skills

Biomedical engineers need to be able to communicate with other engineers, medical professionals, and researchers. Use your lab experiences to build these traits.

### 10. Network

Make friends with the graduate students...they have a lot to teach you.

\* Angela Bailey wrote this list with her major, BME, in mind, but believed it applied to any major.



Students discuss their research at the Spring 2006 UROP poster symposium



# Undergraduate Research News

## Faculty Profile: Dr. Andy Smith, Vice-Provost & Professor of Psychology



*“Every undergraduate degree program can incorporate the research option into its degree” — Dr. Andy Smith, Vice-Provost for Undergraduate Studies and Academic Affairs*

“Undergraduate Research transformed me,” commented Dr. Andy Smith, Vice-Provost for Undergraduate Studies and Academic Affairs and Professor in the College of Psychology, during a recent discussion. As an undergraduate student, Smith had plans to attend law school after completing his B.S. degree, but a stint as an undergraduate researcher in psychology led him to discover that a life in academia was for him.

When asked about the importance of research for undergraduate students, Smith said that undergraduate research shows the student what the academic and research profession is about. Participating in and presenting research

will be important to graduate school admissions, as well.

Smith admits he gets excited seeing the “lightbulb” go on with students involved in research. Despite many competing demands on his time, Smith continues to mentor undergraduate students in his laboratory on related to adult age differences in memory. Most of these students are psychology majors who have already taken research methods and statistics courses. Many of the students develop their own ideas for projects and most are asked to perform real research tasks beyond just running data sets. His vision is that undergraduate researchers feel like research colleagues within his laboratory

and not just research “assistants”.

When asked about the importance of the new Research Option (see *description below*), Smith replied that he would like to see every undergraduate degree program on campus incorporate the option into its degree. Smith believes that undergraduate students at Georgia Tech are “unbelievably good, hardworking, smart, and well prepared.” He goes on to say that every faculty member at Tech is engaged in research—“we should offer this opportunity to students as well.” The research option gives students a chance to develop their own research topics with faculty and to complete an entire project while an undergraduate student.

## Research Option

Research Option offers students the opportunity for a substantial, in-depth, long-term research experience not found within a typical course setting. An undergraduate research thesis is the capstone of the project. One-on-one student and faculty mentoring is also a highlight of the experience. Students are encouraged to work with their faculty mentor to develop a publication or conference presentation in addition to the actual thesis.

Exact requirements for research option vary by school, but students typically:

- Complete at least 9 units of undergraduate research
- Over at least two, preferably three terms
- Research may be for ei-

ther pay or credit

- Take the class LCC 4700 “Writing an Undergraduate Thesis” during the thesis-writing semester
- Write an undergraduate thesis

At least six of the nine required hours of research should be on the same topic. A research proposal must be approved by a faculty advisor and one other faculty member.

Completion of Research Option is noted on the student’s transcript.

Degrees currently offering the option include:

- Biology
- Chemical and Biomolecular Engineering

- Computational Media
- Computer Science
- Earth and Atmospheric Science
- Electrical and Computer Engineering
- Materials Science and Engineering
- Psychology

Watch for additional options in Fall 2006.

Interested in the option, but don’t see your major listed? Contact the UROP program and the academic chair in your school.

For additional information about the option and specific offerings within various schools at Georgia Tech, visit [www.undergradresearch.gatech.edu](http://www.undergradresearch.gatech.edu)



Divya Kilb (R) discusses her winning IAC poster with Dr. Pete McGuire at the Spring 2006 UROP poster sym-

## Student Profile: Taylor Narewski, Public Policy

Taylor Narewski, a junior from Birmingham, Alabama, says that students have “no real concept of what research is until they try it.” Dr. Monica Gaughan, a Public Policy professor, recruited Narewski to work on a group research project after he completed one of her courses. The project then developed into an individual research effort spanning several semesters that is now leading to a senior thesis.

Narewski has co-authored a paper with Gaughan entitled “Religion and Science Education in the Minds of Young Adults,” which he’ll present at

the American Sociological Association Meeting in Montreal, Canada, this August. According to Narewski, the paper “explores how students reconcile their religious beliefs and scientific understanding. Specifically, the paper examines whether a significant relationship exists between religious character/background and attitudes about what should be taught in the science classroom.” Narewski felt that the project led him to a broader understanding of how people view issues and how they respond to questions.

“Find a project that you

really like,” is the most important piece of advice that Narewski offers to fellow undergraduate students. “The project could turn into a bigger experience than originally anticipated (i.e., a senior thesis).” Narewski felt that starting the research experience with a team was a good way to learn the process behind research and that the individual project allowed a greater focus on specific ideas of the work.

In addition to his research and coursework, Narewski runs the 400m and 4x400m relay as a member of the men’s track team, serves as men’s



track representative to the Student Athletic Advisory Board, is involved in the Fellowship of Christian Athletes, and serves on the Honor Advisory Council.

## ACC “Meeting of the Minds U/G Research Conference



Georgia Tech students at the ACC Undergraduate Research Conference’s Dinner Luau

Georgia Tech was represented by 18 students at the 1st annual ACC Meeting of the Minds Undergraduate Research Conference. The event was held at Clemson University April 24-25, 2006. Student representatives from Georgia Tech included: Angela Bailey, BME; James Cahill, AE; Kristie Fisher, Psych; Sidhartha Gupta, MSE; Stephen Hsu, Physics; Jarret LaFleur, AE; Christopher

Lindsey, CE; Brandon Luders, AE; Maria Petrie, LCC; Chris Puglisi, CEE; David Sibal, INTA; Ander Steele, Math; Chris Van Acker, LCC; Keith Van Antwerp, BMED; Mark Weng, BMED; and a student team from AE including Kevin Flaherty, Brandon Luders, Sapan Shah, and Waqar Zaidi. Each student prepared a 15 minute presentation on their research and answered ques-

tions from peers and faculty audience members.

Congratulations! Georgia Tech was well represented!

Next year’s conference will be held at the University of Virginia April 19-21, 2006. Watch for further details on how to apply to represent Georgia Tech in early January 2007.

## Meet the URAG!

The Undergraduate Research Advisory Group (URAG) was formed to provide guidance and oversight for Institute-wide undergraduate research efforts. The group serves as a sounding board for new ideas and is crucial in the approval process for Research Option proposals by the various schools on campus.

Current members include: Dr. Amy Bruckman, COC, Chair; Dr. Kent Barefield,

COS; Dr. Lawrence Bottomley, COS/Chem; Dr. Jeff Davis, COE/ECE; Dr. Athanassios Economou, COA; Dr. Amanda Gable, Undergraduate Studies; Mr. Douglas Gladden, Student SGA rep., IAC/Public Policy; Dr. Joseph Hoey, Director of Assessment; Dr. Carole Moore, Vice-Provost’s Office; Dr. Chuck Parsons, COM; Dr. Jud Ready, GTRI; Dr. Naresh Thadhani, COE/

MSE; and Dr. Steve Usselman, IAC/HTS. Dr. Andy Smith, Vice-Provost for Undergraduate Studies and Academic Affairs and Dr. Jack Lohmann, Vice-Provost for Institutional Development provide administrative leadership and support to the Institute-wide efforts in undergraduate research.

Others instrumental in beginning Institute-wide initiatives for undergraduate research include Dr. Leigh Bottomley,

Chemistry, who previously served as Undergraduate Research Program Coordinator; Dr. Bob McMath, former Vice Provost for US/AA; and a host of others who served on the Institute’s QEP committee on Undergraduate Research and the Research Option—too numerous to list here.

*Thank you for your service to Georgia Tech and your support of Undergraduate Research.*

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## Undergraduate Research Opportunities Program (UROP)

Thank you for picking up (or downloading) the inaugural issue of our newsletter! I hope that the information inside gives you a small glimpse of Undergraduate Research at Georgia Tech. Look for issues of our newsletter again in the Fall semester.

UROP's role is to facilitate and enhance opportunities for undergraduate students to participate in research during their tenure at Georgia Tech. Continue to watch the newly developed website for information on future activities, funding opportunities, projects, symposia, and workshops. Check back often for information on newly approved Research Options within the schools at Tech and application dates and forms for the President's Undergraduate Research Awards (PURA).

Our program is here to assist undergraduate students in finding research opportunities of quality and substance. Please feel free to contact us if you want to discuss undergraduate research, need assistance in finding a faculty mentor, or just have general questions.

Karen Harwell,  
Director

***We're on the Web!***

**[www.undergradresearch.gatech.edu](http://www.undergradresearch.gatech.edu)**

### Updated Website and New Listserv—Check It Out!



#### Updated Website

The newly updated UROP website was unveiled in May 2006. The website will be the central location for information related to undergraduate research for students, faculty, staff, and prospective students. Resources will be available on funding, research projects, best practices, workshops, and opportunities to present student work. Check back often for new features.

Visit the website at:

**[www.undergradresearch.gatech.edu](http://www.undergradresearch.gatech.edu)**

#### Listserv

To receive information and announcements from Georgia Tech's Undergraduate Research Opportunities Program (UROP), join the **urop-news** listserv.

To join: Send an e-mail to [sympa@lists.gatech.edu](mailto:sympa@lists.gatech.edu) with a subject of "subscribe urop-news"