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Check Out  
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## Tech Represented at ACC Undergrad Research Conference

Two years ago, the Presidents of Atlantic Coast Conference (ACC) member schools decided to begin highlighting the academic excellence of its member schools in addition to its athletic achievements. Two initiatives were chosen for support, undergraduate research and international programs. In its second year, the ACC Undergraduate Research Conference has attracted students interested in presenting their work in a multi-disciplinary atmosphere. The conference this year was hosted by the University of Virginia (UVA) in Charlottesville, VA, April 13-14, 2007. Georgia Tech was represented by four students this year:

- **Amaris Gutierrez-Ray**, Literature, Communication and Culture *A Cross-Disciplinary Look at Landscapes*  
Mentor: Dr. Ron Broglio, LCC

- **Ross Marklein**, Biomedical Engineering, *Biodegradable Microsphere-Mediated Delivery of Differentiation Factors to Embryonic Stem Cells*  
Mentor: Dr. Todd McDevitt, BME

- **Summar Shoaib**, International Affairs, *Women's Empowerment After the Fall of the Taliban*  
Mentor: Dr. Sylvia Maier, International Affairs

- **Trang Thai**, Electrical and Computer Engineering, *Super-Yagi: A Novel High-Gain Antenna Array for Wireless HDTV*

Mentors: Dr. Manos M. Tentzeris and Mr. Gerald R. DeJean, ECE

Students from all schools learned a great deal about the differences in research across the disciplines, not to be afraid to ask hard questions of their peers, and a little about the history of UVA. Highlights of the event included student oral presenta-



(L to R): Russ Marklein, Amaris Gutierrez-Ray, Trang Thai, and Summar Shoaib

tions, a visit from Thomas Jefferson at the concluding banquet, a tour of campus, and a trip to the Friday evening UVA-GT baseball game (Go Jackets!). Additional information on the conference, including a list of presentations, can be found at: <http://www.virginia.edu/cue/conference2007>.

Next year's conference will be held at Florida State University, April 18-19, 2008. Watch the UROP website for further details on how to apply to represent Georgia Tech in early January 2008.

## 2007 Spring Research Option Graduates!

Congratulations to the Spring 2007 graduates of the Research Option program.:

- Joseph Bear, Biology
- Nicholas Boechler, AE
- Katherine Fluke, Biology

- R. Steven French, CS
- Megan Heaphy, Biology
- Christopher Kramer, CS
- Matthew Kurjanowicz, CS
- Lively Lie, Biology
- Zen Mehra, EE

- Meryl Mims, Biology
- Sara Paglioni, Biology
- Robert Scott, AE
- Charles Warden, Biology
- Matthew Wood, CS

# Undergraduate Research News

## Student Profile: Robert Scott, AE

By Nikta Pirouz, Psychology



Robert Scott had an interest in wind energy before he found out about relevant research opportunities at Georgia Tech. However, after searching for research opportunities, he realized that Dr.

Lakshmi Sankar's research projects in the Aerospace Engineering department fit his interests perfectly. Scott's projects are mainly focused on the variability of wind speed and other factors such as terrain effects and wind turbine operating costs. While working under the guidance of Dr. Sankar, Scott has been able to learn more quickly about wind energy than he would have on his own and gain valuable advice while writing his thesis. Most importantly, Scott has been able to research a topic that really interests him and

make useful advances in the field of wind energy. He has presented his work at both BGCA's GT squared and two Spring Symposiums here at Georgia Tech and is currently working on his thesis. Scott received a President's Undergraduate Research Award to fund his research.

Scott advises other undergraduates who are interested in research to make sure not to "let school get in the way of learning! Nothing in class can beat having a research project that you can claim as your own and take pride in." Scott also

believes that through his undergraduate research experience at Georgia Tech, he has learned more than just the principles of wind energy; he has also learned how important it is to be on the lookout for opportunities that interest him, as it would have been "ironic but unfortunate coincidence if I had passed by the chance to work in this great field simply because I wasn't aware of it."

In addition to his research, Scott spends his time enjoying the city of Atlanta with his friends and cheering on the Braves at Turner Field.

## GTREP Students Take To the Beach For Summer Research

During summer 2006, Dr. Kevin Haas, civil engineering professor at GT Savannah, led a pilot study involving bathymetric surveying on Tybee Island near Savannah GA. The purpose of the project was to gain understanding in how coastal processes affect the evolution of beach profiles. Two undergraduate students, Jennifer Goldberg and Maggie Yoder worked with Dr. Haas and two graduate students on the project. The students were exposed to state of the art surveying techniques and received hands on experience by helping to fabricate the instrument mounts for the boat used in part of the surveying pro-

ject. The work included hands-on activities such as drawing, cutting, welding, and constructing the apparatuses needed to perform the beach research. They participated in field work consisting of bathymetric measurements using a RTK GPS system carried in a backpack for the dry and shallow regions and coupled to a fathometer mounted on a zodiac inflatable boat for the offshore regions. In addition, they obtained sediment samples and analyzed them to determine the grain size distribution. Four to five actual trips were made to Tybee Island to gather sand samples and use the rover/backpack equipment

to detect changes in the surface of the beach. Maggie pointed out that they learned how concepts discussed in class can actually be applied in real life. She commented that she "learned how to weld, and use a plasma cutter, and drive a boat... who knew I could do such things?"

Having lived in Savannah her entire life and having visited Tybee Island, Jennifer mentioned that it was "fascinating...to see how the beach that I had visited so often was continuously changing." She also talked about the fact that the whole experience went beyond the



classroom. Jennifer remarked, "I was able to become familiar with every aspect of the research unlike some classes where you learn something written in a book and sometimes don't have the opportunity to fully understand its origin."

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## Faculty Corner

*Resources and Tips for Faculty mentors of undergraduate researchers will be presented in this section of each newsletter.*

### Research for Pay – Non-billable, Audit Credit for Students

As a reminder, when undergraduate students are paid for their research, they should sign up for the non-billable (i.e., free), audit course. This allows a student's work to appear to prospective graduate schools and employers on their transcript and is also required for any Research Option student applying hours of a research assistantship to the requirements. Course numbers to use are:

XX 2698 – Freshmen and Sophomores

XX 4698 – Juniors and Seniors

Students should register for 1 hour of credit for each 3 hours per week they average on the project. Students must obtain permits to register for these courses (procedures vary from school to school). Students being paid for research should NOT earn course credit for a grade for the same project.

### Research Option Update

Pending final approval at the May 1<sup>st</sup> Academic Senate meeting, three additional schools will be adding the Research Option to their degree offerings: Chemistry and Biochemistry; Physics; and History, Technology, and Society. This will bring the total number of schools participating in the option to fourteen. For additional information on the option, including information on how to participate, please visit: [http://undergradresearch.gatech.edu/research\\_option/](http://undergradresearch.gatech.edu/research_option/).

### Grant Writing & Private Funding

UROP is interested in collaborating with you on proposals related to undergraduate research. Just contact Karen Harwell, Director, Undergraduate Research, for additional information or to simply toss around ideas. The program is also planning to work with the Office of Development in securing additional funding for undergraduate research support. Your college or school may be interested in working together.

# PURA

President's Undergraduate Research Award

**Fall 2007 Applications due May 15**



Apply for competitive \$1,500 salary awards or up to \$1000 funding to present your work at a professional conference

Visit <http://www.undergradresearch.gatech.edu/funding.php> for more information and application instructions.

# Undergraduate Research News

## GTREP Students ...cont'd from page 2

### The Student Perspective

When asked to describe their experience and their suggestions for other students, both Jennifer and Maggie offered some excellent advice. The number one piece of advice Jennifer would give to fellow undergraduates who might be interested in research would be, "Before your undergrad college career is over, definitely explore some sort of undergrad research as an opportunity to earn some class credit hours and have fun while doing so." She goes on to say that while their relationship with Dr. Haas was very professional and the work demanding, they also tried to have a little fun, after all, they were at the

beach!

Maggie described the experience as hard work, but definitely worth it. She suggests that students not sign up for research if they are lazy or unorganized since many times faculty will allow students to decide their own schedule for working on the project. Self-discipline is key. She continued by saying, "Dr. Haas trusted Jennifer and I enough to let us take charge and actually become part of the research. I appreciated him using us to help him the way that he did, instead of simply using us as personal secretaries or gophers. We were really able to learn from him."

### The Faculty Perspective

When asked how he became involved in mentoring undergraduate research, Haas mentioned that during his first summer as a faculty member at Georgia Tech, he had a significant amount of experimental video data footage to analyze and did not yet have graduate students to assist him in the work. In-

stead he brought on one of his top undergraduate students to work with him on the data. The student ended up doing an excellent job on the work and eventually staying on to complete his master's degree in civil engineering. Through this Haas realized the value of working with undergraduates in research projects.

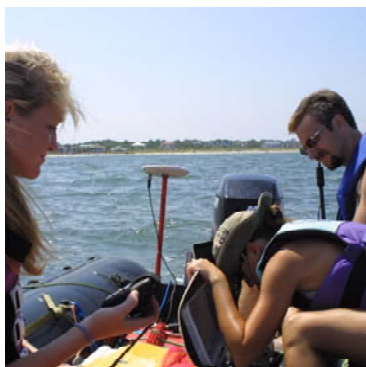
Haas went on to discuss the benefits of undergraduate research. He mentioned, "getting students involved in research as undergraduates can also help them get excited about science and engineering, getting them out of the classroom experience and possibly helping them decide if they are interested in graduate school." He also mentions that participating in undergraduate research helps a student to build a more personal relationship with the faculty, allowing him/her to better understand what it is that faculty do outside the classroom. Haas has mentored several students on various projects—many to analyze data which had been previously collected or to develop new techniques for data analysis. Several projects



were used to investigate new topics for research and the background information necessary to formulate stronger proposals for various research projects. Much of the work has led to papers in the field.

When asked what a student should do to become involved, Haas replied that they should find out more about the type of research the faculty are involved with in their areas of interest and then meet with the faculty to discuss the work. He mentions that it is "important to discuss research interests and not

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## What Undergraduate Research Means To Me

By Katie Fluke, Biology

Participating in undergraduate research has been my most meaningful experience at Georgia Tech. I currently work as part of a research team in the lab of Dr. Alfred Merrill in the School of Biology. We study how a drug, in clinical trials for many types of cancer, causes cancer cell death.

Undergraduate research has provided me with many opportunities. For example,

this fall I presented my lab's findings at a regional scientific conference alongside graduate students. Currently I am currently compiling my work into an undergraduate thesis through the most recent Georgia Tech undergraduate degree designation: the Research Option. The new Research Option allows students like me to assemble an undergraduate thesis that serves as a capstone to our

research experience at the Institute.

In addition to unique opportunities it offered, my undergraduate research experience taught me more about science and about myself than any combination of classes. I have learned how to evaluate real-life scientific problems and apply concepts learned in my studies to actual situations. I have also learned my personal preferences; I better

know the types of problems that interest me and the work environments that I enjoy.

Next fall I will begin graduate studies at Vanderbilt Medical School. I hope to find an outlet during the course of studying medicine to exercise my passion for scientific inquiry that I learned through my undergraduate research experience at Georgia Tech.



## Student Profile: Lauren Hayden, Chemistry

By Ander Steele, Math

Last fall, Lauren Hayden presented a poster of her research to the Herty Medal Undergraduate Research Symposium. Her work on organic light-emitting diodes, or OLEDs, won best poster. As a result, she received 500 dollars to travel to Chicago and present her poster to the National American Chemical Society.

Lauren, a fourth year chemistry major, began working with Professor Seth Marder's research group during the previous summer as part of an REU program. "I really liked the work I was doing so I stayed through the

fall working as a research assistant for course credit," she says. As part of the research group, she works to synthesize molecules and has gathered important data for use in publications. The problem with modern OLEDs is that they aren't durable enough and don't last long enough. The ultimate goal of her work is to synthesize molecules that will improve the efficiency and durability of OLEDs. Technically speaking, Lauren is working on the synthesis and characterization of norbornene-functionalized polymerizable materials. Thus far, she has

produced some promising materials. This is exciting news, since efficient and durable OLEDs could possibly replace the ubiquitous liquid crystal displays. According to Lauren, OLEDs do not require backlights to function and thus require less power to operate. Additionally, OLEDs "can also be fabricated on more flexible materials allowing for the possibility of roll-up displays and portable screens."

This semester, Lauren continues her work in Professor Marder's group. She plans to continue her work this summer as a temporary lab technician before she enrolls in the Ph.D.



program at Georgia Tech. As a Ph.D. student, she will continue working under the guidance of Professor Marder on another exciting project.

CONGRATULATIONS ANDER STEELE ON WINNING THE SIGMA XI  
BEST UNDERGRADUATE RESEARCH AWARD!!!



## GTREP Students ...cont'd from page 4

just go up to a faculty member and ask if you can do undergraduate research with them."

Haas will be mentoring three more students for the summer 2007 term on several coastal projects relevant to the local community. One project will involve measuring the wake produced by the large container ships entering the Savannah River in order to assess the impact on the Tybee Island shoreline. Also, the beach profile monitoring that began last summer will be expanded to include direct monitoring of the shoreline

position along the entire island.

### Where They Are Now

Both Maggie and Jennifer have graduated from GTREP with bachelor's degrees in civil engineering. Maggie is a Transportation Engineer Associate for the Georgia Department of Transportation. She hopes to continue with the department and to move forward to learn about all aspects of transportation including design, construction, maintenance, traffic operations, and administration. Jennifer, an avid coastal enthusiast, works for a local

Savannah civil engineering firm at which she interned with for the four summers leading up to graduation.

For more information on Dr. Haas's project or other research at GT-Savannah, contact:

Dr. Kevin Haas  
(kevin.haas@gtsav.gatech.edu)

Dr. Farrokh Mistree  
(farrokh.mistree@me.gatech.edu)



# Undergraduate Research News

## 2007 Undergraduate Spring Symposium & Awards Photo Gallery





## Undergraduate Research Spring Symposium & Awards April 4, 2007

### Outstanding Oral Presentations

#### College of Architecture

Amy Plauche, Architecture, *Library East Commons Research*

#### College of Computing

David Mann and David Rutter, COC, *Random Projection and Learning*

#### College of Engineering

Chanchala Kaddi, BME, *Review and Comparison of Systems Biology Modeling Approaches for Translational Research*

#### Ivan Allen College

Lindsey Chatel, STAC, *The History of Pain*

#### College of Sciences

John Widloski, Physics, *Mixing by Steady Flows in Thermocapillary Driven Microdroplets*

### Outstanding Undergraduate Researcher Award

**College of Architecture** -- Nadine Kashlan, Architecture

**College of Computing** – R. Steven French, CS

**College of Engineering** – Jarrett LaFleur, AE

**College of Sciences** – Catherine Silvestri, Chemistry

**Ivan Allen College** – Greg Leo, Economics

### Poster Session – Outstanding Posters

#### College of Architecture

Lisa Thompson, Architecture, *Carnegie Libraries: The Birth of the Public Library*

#### College of Computing

Trevor Bentley, CS, *Haptic Laser Pointer*

#### College of Engineering

##### **1<sup>st</sup> place**

Masayuki Yano, AE, *Numerical Simulation of Annular Helicon Plasma*

##### **2<sup>nd</sup> place**

Alex Gavrilovski, AE, *Experimental Analysis of Wave Propagation in Hexagonal and Chiral Cellular Structures*

##### **3<sup>rd</sup> place**

Martha Lesniewski, MSE, *Thermo-Mechanical Behavior of Epoxy Shape Memory Polymer Foams*

#### Ivan Allen College

Jenifer Vandagriff, STAC, *Italian Futurism Cinema: Technological and Cultural Impacts*

#### College of Sciences

Brian Nakamura, Math, *Alexandrov's Conjecture*

## Congratulations To All Of Our Awardees!!!



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## Undergraduate Research Opportunities Program (UROP)

### News from the Director

Whew! What a busy semester! UROP's April 4<sup>th</sup> Undergraduate Research Spring Symposium and Awards was attended by at least 150 individuals, with 60 students participating in either poster or oral sessions. (A photo spread from the event and a list of prize winners can be found on pages 6 & 7.) The Student Advisory Board for Undergraduate Research (SABUR) planned the first institute-wide awards ceremony celebrating undergraduate research (see page 7) and a library talk by two undergraduate researchers, wrote articles for this newsletter, and began to gather new information for the UROP website. Four students participated in the ACC's Undergraduate Research Conference at UVA (see page 1). Fourteen students are on schedule to graduate with the Research Option this Spring in four schools (see page 1). UROP also sponsored eight workshops for students, faculty and graduate students this semester which were primarily facilitated by various faculty from across campus. Individual schools and colleges also held their own poster sessions and sponsored additional awards commemorating undergraduate research – something else to celebrate!

None of these events or accomplishments could have been successful, or even attempted, without the participation from literally hundreds of faculty, staff, and students across campus. While we do not have room to name each person individually (and we'd no doubt miss many names), I'd like to personally thank them for their support of and commitment to undergraduate research at Georgia Tech!

I encourage you to take the time to congratulate not only our award winners, but all students who participated in the spring symposium and those who will be graduating with the Research Option. A big hand also goes out to their mentors – both faculty and graduate students!

Enjoy the articles in this edition of the newsletter and your summer!  
Karen Harwell

### Let Your Voice Be Heard!!

**Georgia  
Tech**



## Undergraduate Research Opportunities Program



### **Student Advisory Board for Undergraduate Research (SABUR)**

The newly formed Student Advisory Board for Undergraduate Research (SABUR) works toward implementing new ideas for programs and resources for students interested in research. If you're interested in serving on this board, please contact Dr. Karen Harwell, Director, Undergraduate Research at [Karen.harwell@carnegie.gatech.edu](mailto:Karen.harwell@carnegie.gatech.edu). Freshman, sophomores, and juniors are particularly encouraged to become involved!

### **WE WANT TO HEAR FROM YOU!!!**

We are always looking for subject matter for our newsletter, including suggestions of students and faculty to profile and good news to share about student achievements, publications, and presentations. If you are interested in writing for the newsletter or have suggestions for future profiles, please contact us at [urop@gatech.edu](mailto:urop@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"