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Find Out  
about  
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Greenland  
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## Student Profile: Michael Rohling, HTS

By Nikta Pirouz, *Psychology*

Michael Rohling's interest in history and documentary filmmaking made him the perfect candidate for an internship with Georgia Tech's Living History Program. The living History Program serves to collect and preserve information about Georgia Tech's past. Rohling has been an intern since 2005. The internship has provided an opportunity for the fourth year HTS major to perform in depth research on a topic that had not been thoroughly examined before. Rohling worked with Dr. Doug Flammig and Marilyn Somers to find information in the public domain about the Georgia Tech Glee Club. Because the Georgia Tech Glee Club, founded in 1907, is Tech's oldest student organization; this was no small task. Without this type of historical research, parts of the history and legacy of the organization could be lost forever.

Rohling was able to be involved in every aspect of research, because this was a special project independent from Dr. Flammig's research. As a result, he was exposed to many research techniques and methods of video production and filmmaking he was previously unfamiliar with. He also received a President's Undergraduate Research Award to fund his research. Rohling's research was used in the production of the Georgia Tech Glee Club's centennial video, titled "The South's Liveliest Singers: 100 Years of the Georgia Tech Glee Club." The video premiered at the Glee Club's centennial concert at Spivey Hall on April 3, 2006.

Rohling advises other undergraduates who are interested in research to "look to the professors and other people you are already working with; opportuni-



ties can present themselves in almost any forum."

In addition to research, Rohling is a member of the Georgia Tech Marching Band and Prometheus, Georgia Tech's History Club. He has worked with the Georgia Tech Roll Call since February 2004 and is currently a GT 1000 TL. After graduating in December, Rohling plans to go on to graduate school for Architectural History or Library Science.

## First Research Option Graduates!

Congratulations to the Fall 2006 graduates of the Research Option program.

- Brian Di Rito, *Computer Science*
- Erin Epperson, *Biology*
- Clara Moon, *Biology*
- Christen Pirkle, *Biology*
- Tyler Weston, *Computer Science*

To learn more about the Research Option and how you can participate, please visit [http://www.undergradresearch.gatech.edu/research\\_option/](http://www.undergradresearch.gatech.edu/research_option/)

## Student Profile: Eugene Smith, CEE

By Neela Balkissoon, COM



Eugene Smith and PhD candidate, Gayle Hagler

Imagine living in a desolate, icy world, where the sun shines 24 hours a day. Although despite the never-ending sunlight, the temperature highs are around 10°F and the lows are as low as a frigid -40°F. Getting the chills just thinking about it? Well, just think how Eugene Smith felt when he lived in such a place—Greenland to be precise. For 7 weeks, Eugene Smith did his research in Greenland, during the summer of 2006.

Smith's interest in doing research in Greenland, began when he took an Introduction to Environmental Engineering class with Dr. Mike Bergin. Throughout the semester, Dr. Bergin encouraged Smith to work with him and PhD candidate Gayle Hagler on this project. With enough convincing, he "woke up and realized it was an opportunity of a lifetime—[he should] go for it!"

The research involved examining the levels of particulate carbon in the ice sheet of Greenland. Analysis of the ice sheet can provide researchers information about the levels of carbon in the atmosphere for thousands of years past. The main concern of the research was primarily how the carbon is deposited; it could be from fog, swings in the weather patterns, or even just local climatic patterns. Samples are currently still being processed.

Under Dr. Bergin's supervision, Smith designed an experiment in order to assure the collection of all particulate carbon on the filters. He used Titanium dioxide as a flocculant to clump the carbon together so that it would not pass through the filter. In place of the Greenland samples, Smith pumped air through deionized water so it could collect any particulate matter from the air. He then used the water sample with varying concentrations of Titanium dioxide to determine its effectiveness in preventing carbon from passing through the filter. Smith also did experimental work with absorption coefficients this past fall using a spectrophotometer with samples from Greenland to determine the chemical make-up of the particles.

In June 2006, Smith arrived in Greenland and stayed at an NSF Facility called the Summit Station. This was his icy home for 7 weeks. Because the camp was literally on

top of an ice sheet, he stayed hydrated by drinking Gatorade in order to prevent altitude sickness. Sleeping in tents for the first week was rough considering the extremely cold temperatures and the 24 hours of sunlight during the day. There were about 30 people, including some NASA employees, camped out doing research. Everyone's sleep schedules were completely turned upside-down because of the light. Smith's work schedule went from 3am to 11pm!

Continued on page 4



View of Summit Station campsite

# PURA

President's Undergraduate Research Award

**Summer 2007 Applications due March 1**



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.

## Faculty Corner

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

### Synergies between Scholarship and Teaching

The Winter 2006 issue of *Peer Review*, published by the Association of American Colleges and Universities (AACU), is devoted entirely to the discussion of Undergraduate Research. One specific article of note, "Undergraduate Research Experiences: Synergies between Scholarship and Teaching," by Tim Elgren and Nancy Hensel, discusses the recent transformations in curriculum across the country in response to the understanding that inquiry-based, discovery-based, or creative experiences for students (including undergraduate research) are important for preparing stu-

dents for the "independence required for a successful research experience". The article discusses the benefits for faculty and provides information on return on investment and participation.

To read the full text of this article (and other selected articles in the publication) visit: <http://www.aacu.org/peerreview/pr-wi06/index.cfm>.

### Interested in finding new ways to integrate research into the undergraduate curriculum?

Articles in the March 2006 issue of the *CUR Quarterly* discuss various ways in which different universities across the country have successfully implemented new ideas.

In one article, faculty from the biological sciences, chemistry, and biochemistry at Duquesne University designed an integrated laboratory experience for undergraduate science majors with a two-semester sequence which incorporates multidisciplinary techniques and ideas. In another article, the Pomona College Geology department created a "Community of Research" with two main goals: challenging the notion that only seniors were able to participate in meaningful research and helping students realize that research is an integral part of their education. The mathematics department at St. Edwards University developed a four-semester sequence for juniors and seniors of one credit courses

taken with one faculty mentor on topics such as research methods, undergraduate research (taken twice), and senior seminar. Additional examples from other colleges are also included.

All articles in the issue provide an overview of the program discussed, mention challenges to the curriculum, faculty, and students, and discuss benefits of the new programs. Selected articles from the *CUR Quarterly* can be found at: <http://cur.org/Publications/Quarterlies.html>.

For further information on how to obtain a specific article not available online, contact the UROP office at [urop@gatech.edu](mailto:urop@gatech.edu).

## Faculty Interview: Dr. Han Zhang, COM

Dr. Han Zhang is an associate professor in information technology management. His research focuses on the economics of information technology, online trust and payment methods, and the evolution of electronic markets. Dr. Zhang came to the United States from China and completed his Ph.D. at the University of Texas at Austin. He has won several awards related to his teaching, but more importantly he works with undergraduate students on research projects! Recently, UROP asked Dr. Zhang several questions related to his work with undergraduates in the College of Management and his responses are reported below.

### U/G Research: How did you become involved as a mentor to undergraduate researchers?

**HZ:** I started getting involved in Spring 2002. At that time I was working on studies on electronic commerce and I kept collecting data from the Internet. Collecting data is quite time-consuming and I learned that we could have the opportunity to get some undergraduate researchers. I applied for the undergraduate re-

search program (at that time this program was not even called PURA (President's Undergraduate Research Award)) and two undergraduate researchers started working with me. This was how I started.

### U/G Research: What types of projects have you mentored? How do you utilize undergraduate students in your research?

**HZ:** I have mentored several projects on electronic commerce. Usu-

ally, those projects were empirical studies based on data collected from the Internet such as online payment choices, the impact of trust assurance seals in electronic markets, and the determinants of online merchant rating. I mainly utilize undergraduate students in my research in the early stage. Due to the nature of my research, I usually take at least a year to finish a research project, but the PURA program usually cannot support undergraduate researchers for that long. So, I generally use



undergraduate students in my new research projects.

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# Undergraduate Research News

## Faculty Profile: Matthew Baker, Math

By Ander Steele, Math

In my freshman year, I was enrolled in a Number Theory course with Dr. Matt Baker. After a lecture on Carmichael numbers, a type of pseudoprime, I approached Dr. Baker with a few questions on generalizing these Carmichael numbers. Not knowing the answers, Dr. Baker suggested I perform some numerical experiments. I wrote a few lines of code, let my computer run for a while, and returned to the next class with some interesting numerical data. Soon afterwards, Dr. Baker suggested that I continue my explorations over the summer as part of GT Math's Research Experiences for Undergraduates (REU) program. The research project lasted for two summers and resulted in a presentation at the ACC Meeting of the Minds undergraduate research conference at Clemson University and a paper submitted for publication in a research journal. Without a doubt, working with Dr.

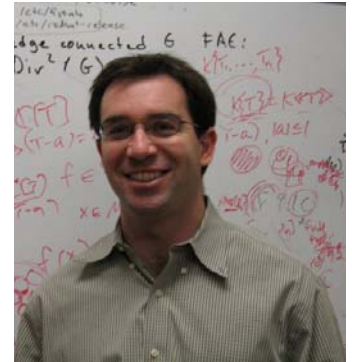
Baker has been the highlight of my career at Georgia Tech.

Dr. Baker has supervised many undergraduate research projects, including several at Georgia Tech. His first experience supervising undergraduate research was at Harvard, where he supervised a senior thesis. At UGA, Dr. Baker and Dr. Robert Rumely supervised a group of seven students from across the country in an REU on metrized graphs. "It was a good experience. Very intensive," says Dr. Baker. "The students made interesting conjectures and even disproved one of Rumely's conjectures." Since then, Dr. Baker has continued to work with undergraduates on research projects. According to Dr. Baker, undergrad research has two key benefits: giving students an idea of what grad school is all about, and letting grad schools know how creative and independent a student is. "Some people decide they really love research. Sitting around for a

month stuck on an unsolved problem may be stimulating to some.

Others can't imagine a worse nightmare." He adds, "I felt that when I entered grad school, I didn't know what math research was about. REU programs were not too big back then."

Asked why else he has been involved with undergrad research, Dr. Baker says his research interests are suitable for undergraduate students and that he enjoys working with undergrads. Dr. Baker often enlists undergrads to help write computer programs to numerically test conjectures. "It helps that I'm not a very good computer programmer," he jokes. "It takes me a long time to write programs." Enlisting the help of undergrad students not only helps him, "but it's great because students get the opportunity to get involved in active research." Furthermore, explaining concepts or questions to an undergraduate is useful for clarifying things. "If you force yourself to think about how you would explain



things to undergraduates, you sometimes find new insights into what it is you're really doing."

In addition to supervising undergrad research projects, Dr. Baker coordinated the GT Math REU program during the previous two years. As the program coordinator, Dr. Baker expanded the number of participants, formalized the application process, and introduced a mini-conference where students present their results to the other participants. Currently Dr. Baker is part of a four-person committee coordinating the REU program.

## Student Profile: Eugene Smith ...cont'd from page 2

Smith spent a year working on this research project; he earned two semesters of course credit and was paid for another two. He believed that this year-long experience was a "life-experience". An important element in making the experience great was the lack of a typical teacher-student relationship. "Dr. Bergin is great; we had a good relationship, like colleagues" commented Smith. Some advice Smith gives to his fellow undergraduates who might be

interested in research is, "get to know your professor". Get to know him or her especially if the topic being taught is one of interest to you, and even more so if the professor is easy to get to know – don't be intimidated, they are intelligent individuals!

"Doing research is great and different from any other experiences you will ever have in school. It will put the rest of your college experience in a different light. After all, you are not being graded,

so you learn so much more by trying new things without the fear of failing," Smith said.

Currently Smith's hobby is the pursuit of happiness, which genuinely shined through in his warm demeanor as well as in his extracurricular activities. He is a member of Chi Epsilon, a Civil Engineering honor society, and he tutors his peers and Centennial Elementary School students. Smith also keeps busy with a clothing/merchandising company (which he

founded) for a band called Sound Tribe Sector 9.

When asked about his future career goals, Smith stated that he would like to be "involved in transferring humanity to a more sustainable future". To add to his mantra of living life to its fullest, he leaves this message for any undergraduate reading this article: "you're capable of whatever you want to do, so get involved in undergraduate research!"

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**Faculty Profile: Dr. Han Zhang ...cont'd from page 3**


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*This is how I collaborate with my undergraduate researchers: If I had a research idea, I would contact an undergraduate student and invite this student to apply for PURA with me. If we received PURA, I would communicate with the student clearly about the research topic, research methodology and the research process. The undergraduate researcher always had a good understanding about the whole research project. When we started the project, the students mostly work on literature review and data collection. Even though the students may not be able to completely finish the project, they have a good understanding about how this research would be carried out.*

**U/G Research: What should a student do to become involved?**

**HZ:** First, the student should enjoy doing research. Second,

*the student should be motivated and eager to learn. Third, the student should be serious about what he/she is doing.*

**U/G Research: What are the benefits to faculty of mentoring undergraduates in research?**

**HZ:** I have gotten a lot of benefits by mentoring undergraduates in research. It could be time-consuming to guide an undergraduate researcher, but meanwhile, the undergraduate researcher also helped me in many aspects of my research. Collecting data online is very time consuming. The undergraduate students who worked with me in the past have done a wonderful job collecting data. Also, I got a lot of comments and suggestions on my research from the undergraduate researchers. For example, a couple of years ago, I worked on a project about online payment

*choices. The undergraduate who worked with me that semester was a frequent eBay seller and he had a lot of experiences about online payment choices. He gave me a lot of great suggestions on that research. Overall, in the past several years, undergraduate researchers have helped me tremendously in my research.*

**U/G Research: Why is undergraduate research important?**

**HZ:** From the macro level, Georgia Tech is a research-oriented school, and we should always encourage undergraduate students to get involved in research. From the micro level, I really think it is a win-win situation for both faculty members and undergraduate students. Undergraduate researchers can provide tremendous support and assistance to faculty members in their research. Meanwhile, the undergraduate students can learn

*how to do research during the process as well as find out if they really enjoy doing research. For example, in Summer 2004, an undergraduate researcher worked with me supported by the PURA. He clearly told me that he had seriously thought about pursuing a doctoral degree and conducting research in the future. However, he did not really know if he would enjoy it. He was very excited about the research opportunity because he could somehow test the "research life" and get some feeling about doing research before he decided to pursue a research career.*

If you are interested in research related to Dr. Zhang's work or within other areas of the College of Management, please contact the UROP office.

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**Mentoring Undergraduate Researchers: Roundtable Discussion**


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Graduate students, post-docs, and faculty are invited to join us for a follow-up discussion on Mentoring Undergraduates in Research. In an informal, roundtable fashion, we'll discuss the challenges faced in working with undergraduates, possible solutions to these challenges, and other ideas for

effectively incorporating undergraduates into research projects. We'll also discuss specific topics for future roundtable discussions. Please note that previous attendance at one of our workshops is not necessary to participate.

While not mandatory, since

we are providing refreshments, your registration is appreciated by e-mailing [urop@gatech.edu](mailto:urop@gatech.edu) with "Mentoring Roundtable" in the subject line. Please feel free to include ideas for possible discussion topics in your e-mail.

Light refreshments served.

**Monday, March 26,  
4- 5:30pm, Ferst Room,  
Library (7th floor)**

*Sponsored by the Undergraduate Research Opportunities Program (UROP) and the Center for the Enhancement of Teaching and Learning (CETL).*

# Undergraduate Research News

## UROP Workshop Series Spring 2007

### EndNote - Bibliographies Made Easy!

**Thurs., February 22, 2007**

11am-12:30pm, Homer Rice Center, Georgia Tech Library

led by Ms. Lori Critz, Georgia Tech Library

### Research Ethics

**Wednesday, March 7, 2007**

4-5pm, Student Center Piedmont Room

led by Dr. Robert Kirkman,  
Assistant Professor, Public Policy, and Dr. Julie Swann, Assistant  
Professor, ISYE

### Eye-catching Research Posters: Standard Practices and Standards of Excellence in Scientific Posters

**Tuesday, March 13, 2007**

11-12noon, Student Success Center, Suite C

led by Dr. Lisa Rosenstein, Communications Specialist, MSE and CEE

### Presenting with Power: Effectively and Dynamically Communicating Your Research

**Tuesday, March 27, 2007**

11-12noon, Student Center Crescent Room

Led by Ms. Christina Bourgeois  
Coordinator, Undergraduate Professional Communications Program, ECE

**Visit us on the web at  
[www.undergradresearch.gatech.edu](http://www.undergradresearch.gatech.edu)**



## Undergraduate Research Spring Symposium & Awards

*Sponsored by the Undergraduate Research Opportunities Program (UROP)*

**Wednesday April 4, 2007**

College of Architecture

West Wing Atrium

Poster Session: 3:00-4:30pm

Oral Presentations, scheduled: 1:00-4:30pm

Reception & Awards Ceremony 4:30-6:00pm

### Why should I participate?

- Share your research work with other students and faculty from all over campus.
- Learn about research in an informal atmosphere.
- Gain valuable skills and experience in presenting your work.
- Make an impact on other undergraduates who may be wondering what research is all about.



Students will have the option of presenting either a poster or oral presentation.

Prizes will be awarded to the top poster and oral presentation from each college. Additional awards will also be given to the Outstanding Undergraduate Researcher from each college, as chosen by the colleges.

Students from all across campus are encouraged to participate.

**Deadline for submission of application forms for the symposium:**

**Monday March 12<sup>th</sup> (no exceptions)**

Visit: <http://undergradresearch.gatech.edu/news/> for more details!

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## Undergraduate Research Opportunities Program (UROP)

### *News from the Director:*

Spring semester is off to a great start! Over 60 faculty and graduate students attended our late January workshop on Mentoring Undergraduates in Research co-sponsored by the Center for the Enhancement of Teaching and Learning (CETL). We also have (at latest count) over 744 undergraduates enrolled in research courses for credit or audit this Spring semester.

Be watching for detailed information in late February on how to participate in Georgia Tech's 2<sup>nd</sup> Annual Undergraduate Research Spring Symposium to be held April 4<sup>th</sup> at the College of Architecture. Our Student Advisory Board for Undergraduate Research (SABUR) will also be hosting an awards reception to honor excellence in undergraduate research across campus immediately following the event.

I encourage you to take some time to read the profiles on our students and faculty in this issue of the newsletter, to attend one of our workshops, and most importantly find ways to be involved in undergraduate research!

Best,  
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).