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See Our  
Feature  
Profile on  
Dr. Ali  
Mazalek  
and her 4  
Students.  
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## Student Profile: Steven Dalton, Physics

### COS student is winner of COC symposium

"This was a life changing experience," stated Steven Dalton about his spring research experience. Initially, Dalton began his research, entitled "*Validation of TCP Prediction Equations of RTCP Transfers*", in the Spring and was able to continue it (using PURA funding) over the Summer. His research involved testing the validity of equations in various network models to predict the speed of an internet connection when downloading information. Al-

though Dalton is a physics major, he got involved in this project because of an interest in network simulators and discovered that Dr. George Riley (an ECE professor and Dalton's mentor) was doing research in this area. When asked about his professional relationship with his mentor, Dalton stated "He reminded me of my dad. He didn't let me get away with anything. He didn't pull any punches. If I did something good, he would compliment me. If I did something bad, he would tell me."

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Alex Orso (COC professor) presents the award to Steven Dalton.

## Faculty Corner

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

### Mentoring

Mentoring an undergraduate student can be a rewarding experience for faculty. The experience offers not only a chance to incorporate additional minds and hands into your own research projects, but also a chance to influence an undergraduate student's experience. Through this mentoring process students are "invited into the community of researchers and scholars as colleagues." (Merkel and Baker)

Watch for a mentoring workshop at Georgia Tech in January

2007. This workshop will be geared toward faculty who have not yet mentored undergraduate students in research and graduate and post-doctoral students who will be working with undergraduates. Watch for additional information on the UROP website, via email, or in the December newsletter.

Limited numbers of the publication *How to Mentor Undergraduate Researchers*, by Merikel and Baker, and published by the Council on Undergraduate Research, are available by emailing [urop@gatech.edu](mailto:urop@gatech.edu).

### Incorporating Graduate Students in Mentoring

Faculty from the University of North Carolina Chapel Hill and the University of California, Los Angeles, discussed best practices in incorporating graduate students in the mentoring of undergraduate researchers at the 2002 Reinvention Center Conference on Undergraduate Research and Scholarship and the Mission of the Research University. Information on the session is available in the conference proceedings at: <http://www.sunysb.edu/Reinventioncenter/conference/urconfschedule.htm>

# Undergraduate Research News

## UROP's Workshop Series

### Scholarly Databases – a researcher's path to smart discovery!

**Thurs., November 9, 2006**

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

led by Ms. Lori Critz, Georgia Tech Library

Uncovering complementary and background information to your research project is also important for undergraduate students. This session will cover the basics of developing search strategies, searching the GT databases and using SFX/FindIT@GT to locate items in electronic and print formats. Get an edge on your research by learning to use these powerful tools!

Space is limited, please register by emailing [urop@gatech.edu](mailto:urop@gatech.edu). Please register by November 3rd!

### EndNote - Bibliographies Made Easy!

**Mon., November 13, 2006**

4-5:30pm, Homer Rice Center, Georgia Tech Library

led by Ms. Lori Critz, Georgia Tech Library

Frustrated with preparing bibliographies and managing reference lists? Instead of spending hours typing bibliographies, or using index cards to organize your references, do it the easy way—by using EndNote! Attend an introductory training session

on using EndNote - the bibliographic management software available to the Georgia Tech community.

Space is limited, please register by emailing [urop@gatech.edu](mailto:urop@gatech.edu). Please register by November 8th!

### Funding Your Research with the President's Undergraduate Research Award (PURA)

**Thursday, February 1, 2007,**

4-5pm. Piedmont Room, Student Center

led by Dr. Karen Harwell, Director, Undergraduate Research,

### Writing Research Abstracts

**Thursday, February 8, 2007,**

11am-12noon, Piedmont Room, Student Center

led by Dr. Amanda Gable, Director, Graduate Fellowships,

### Research Ethics

**Wednesday, March 7, 2007,**

4-5pm

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

### Eye-catching Research Posters

**Tuesday, March 13, 2007,**

11-12noon

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

## Student Profile: Trevor McLeod, EE

### EE student praises undergraduate research at GT

For three semesters, Trevor McLeod has worked in Dr. Jud Ready's lab developing a chemical bath deposition (CBD) recipe for depositing cadmium sulfide on carbon nanotubes for solar cell applications. McLeod's interest in nanotechnology, photovoltaics, and solar cells led him to explore this research opportunity. He enjoyed Dr. Ready's MSE 2001 class and got along well with him. McLeod commented, "I saw this as a good opportunity to do exciting work for a professor who I

could learn a lot from and become friends with." McLeod advises students who are interested in research to find a project that they're interested in and talk to professors who share similar interests. He also adds "the great thing is that no matter what you are interested in at Georgia Tech, there is probably someone who is doing it on campus."

In addition to doing research, McLeod found time to incorporate a study abroad program into his curriculum as

well. Although he enjoyed the study abroad experience in Shanghai, China this past summer, McLeod enthusiastically states "I will never give up my research...Georgia Tech's undergraduate research is great."

After a long day of doing research, the Michigan native unwinds by going to the movies and sports venues. McLeod has played the piano for thirteen years and is a jazz aficionado. His favorite classic jazz artists include: Miles Davis, Thelonious Monk, Louis Arm-



strong, and Duke Ellington. After graduating from Georgia Tech in Spring 2007, Trevor McLeod hopes to utilize his EE degree and research experience in the microelectronics or nanotechnology industry.

## President's Undergraduate Research Award (PURA) Updates

### Did You Know?

PURA funds over 200 students annually thanks to the support of the Georgia Tech Research Corporation. Since their inception in Fall 2002, 895 students have been supported by PURA funds.

The President of Georgia Tech, Dr. Wayne Clough, strongly believes in the value of undergraduates and invites them to experience the excitement of new discovery through research. In Fall 2002, the President's Undergraduate Research Awards (PURA) were established to encourage and support undergraduate research opportunities for all majors. The salary awards continue to provide support to students undertaking research across campus ranging from an International Affairs project examining the status of women after the Taliban to researching soundscapes and dynamic learning environments to defining optimum temperature ranges for catalytic materials. During fall 2006, eighty students were awarded salary

funding and fifteen were provided full or partial funding for trips to present their work at professional conferences. For a complete list of Fall 2006 awardees, their mentors, and projects, please visit the UROP website.

PURA students continue to mention what valuable experience undergraduate research is and how the funding allowed them to become involved.

Past students have commented:

- "This has been one of [my] most valuable experiences while in college."
- "It was a pleasure to have a mentor who shared an interest in the same field as me."
- "I was treated as a member of the research

group."

- "I also greatly enjoyed being able to create something that will help others in the future."
- "I gained valuable experience doing novel research in an interesting field."

Spring 2007 Awards will be announced the week of November 20, 2006. Awardees will be announced on the UROP website.

Considering traveling to a professional conference, symposium, or forum to present your work? The Presidents Undergraduate Research Awards also fund up to \$1000 toward the cost of a student's trip. Applications and tips for travel awards are available on the UROP website.

## Introducing... New URAG Membership

The Undergraduate Research Advisory Group (URAG) was formed to provide guidance and oversight for Institute-wide undergraduate research efforts and undergraduate research efforts under the Quality Enhancement Plan (QEP). 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. Please welcome our new members for AY 2007.

If you have questions, suggestions, or comments on undergraduate research, feel free to contact the URAG members.

**The new URAG Members for 2006-2007 are as follows:**

- Dr. Amy Bruckman, COC, Chair
- Dr. Kent Barefield, COS
- Dr. Amanda Gable, Director, Fellowship Communication Program
- Mr. Doug Gladden, SGA Rep., Public Policy
- Dr. Jon Gordon, Office of Assessment
- Dr. Cliff Henderson, COE (ChBE)
- Dr. Sabir Khan, COA
- Dr. Charles Parsons, COM
- Dr. Jud Ready, GTRI
- Ms. Subina Surendran, BME student
- Dr. Lisa Yaszek, IAC (LCC)

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

# Undergraduate Research News

## Student Profile: Camila Santiago, BME

### BME student goes on summer research cruise



Camila Santiago collecting trichodesmiums with a plankton net.



Camila Santiago and Connie Rich working in the ship's lab.

Camila Santiago spent her summer 2006 vacation on a cruise ship that sailed from Barbados to Cape Verde. Nothing unusual about taking a summer cruise—right? Actually, Santiago was at sea for six weeks on a research cruise. Dr. Joseph Montoya (Biology) recruited Santiago to work with him and fellow undergraduate Connie Rich on research involving the nitrogen fixation cycle and its effects on marine microorganisms.

A \$1000 materials and supplies grant from UROP during summer 2006 helped to purchase one of the special nets and other supplies that were used to run extra experiments for the undergraduates' projects.

For the first few days of the cruise, Santiago learned how

to use the equipment aboard the ship's lab and general oceanic techniques. She was then ready to begin her mission. Santiago was responsible for filtering water samples at various depths and analyze the isotopic values, nitrogen, and carbon rates in microorganisms such as trichodesmiums. She soon realized that in research there will be errors and discrepancies, and when you're in the middle of the ocean, you just have to improvise. Santiago explained, "If you make a mistake, you can't fix it....you have to salvage what you could and go with the flow."

Santiago began this project as a freshman (she's currently a sophomore) and although her major is BME, the experience at sea has her thinking about maybe pursuing Biology.

She advises students interested in research to start as early as you can. "I didn't know that you can do research as a freshman," she replied. Her suggestion is to find something that you're interested in, then email professors to find out what they're interested in because they need freshman to help with their research.

Camila Santiago is a firm believer of incorporating fun and relaxation with the day to day toils of academia. Currently, she is a member of the Georgia Tech Chamber Choir, Society of Women's Engineers, Alpha Omega Epsilon, and SWARM (a cheering squad for athletic events). In her spare time, Santiago enjoys Salsa, Tango, and Ballroom dancing. This multifaceted researcher even has a blackbelt in Taekwondo!

## The Research Option: A Competitive Advantage

The Research Option, an optional program of study available to undergraduate students in several majors, is a demanding research program designed for students who wish to excel beyond the typical undergraduate degree. While requirements vary by school, general requirements for the Research

Option include:

- **Research Experience:** Complete nine units of supervised research.
- **Thesis Writing Course:** Complete a two-credit thesis writing course. Most plans require students to complete LCC 4700. Other plans require an approved equivalent.
- **Research Proposal:** Write a research proposal.
- **Thesis/Report:** Write a thesis or other substantial written report documenting the results of the research.

Research Option Benefits include: special designation on your transcript, one-on-one research with Georgia Tech

faculty and a contribution to new knowledge in your field. Currently, the Research Option is available in eight schools. Four schools have plans in the approval process.

For more information about the Research Option, please visit [www.undergradresearch.gatech.edu](http://www.undergradresearch.gatech.edu)



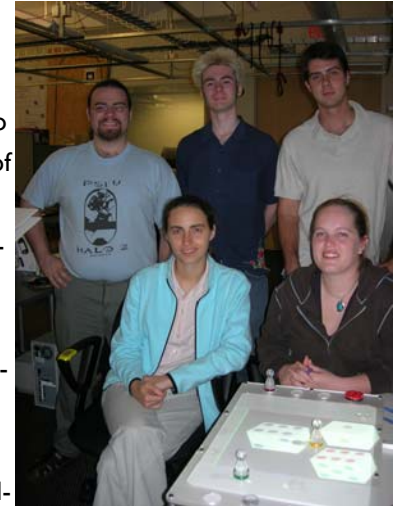
## Profile: Ali Mazalek, LCC & students Dana Van Devander (CM), Nigel O'Rear (STAC), Elijah O'Rear (CM), Basil Mironer (CM)

### RPGs and Research?

At first thought one would not automatically think of research and RPGs (role playing games) in the same breath. However, that's exactly what four undergraduate students are doing in Dr. Alexandra Mazalek's laboratory at Georgia Tech. Mazalek, an assistant professor in the School of Literature, Communication, and Culture, is researching interaction and sensing technologies which help bridge the physical and digital worlds in creative ways. Initially her TVViews table research involved interactive storytelling and media browsing interfaces, as well as educational uses like math activities for preschool and kindergarten. But other applications exist including game play, design of prototypes, and systems simulation, among others. Now, several undergraduate students have brought a role-playing application idea to fruition in the laboratory.

Computational Media senior Dana Van Devander and recent STAC graduate Nigel O'Rear both viewed a demonstration of Dr. Mazalek's work with the TVViews table during a course and were instantly interested in the table and possible applications. Nigel had seen the tabletop used in music authoring and recognized the work. During his spare time he enjoys role playing games and had an idea for a multi-user, multi-level role playing game using the table. After the first semester of work, Dana and fellow senior Basil Mironer also approached Dr. Mazalek about continuing the project for the capstone of their Computational Media degree. This allowed them to each use their individual talents best in a team project. Dana was mainly involved in the computer programming aspects while Basil worked on the human centered evaluation aspects of the project. Nigel's brother, Computational Media sophomore Elijah, became involved during the summer after his freshman year due to his interest in role-playing games and video game design.

Together the students comprise a project team working on the TTRPG (TVViews Table Role-Playing Game) project. The goal is to "bridge the separate worlds of traditional table-based RPGs with the growing area of massively multiplayer online role-playing games (MMORPGs)." The TVViews table (see accompanying photos) was built by Dr. Mazalek using commercially available sensing technology. The platform "can track the location of multiple tagged objects in real-time as they are moved around its surface, providing a simultaneous and coincident graphical display." The ultimate goal of the project is for end users to test the table and RPG application for functionality and usability. The students felt that the largest challenge they face in their work is merging the creative with the practical or technical aspects of the project (i.e., communicating between gaming experts and non-experts). They felt it important to maintain the "feel" of an RPG but to provide a new medium by which to experience the game. Aspects of the RPG that enhance the cooperative experience of working together



Front Row, L to R: Dr. Alexandra Mazalek, Dana Van Devander. Back Row, L to R: Nigel O'Rear, Elijah O'Rear, Basil Mironer

to meet a challenge needed to be maintained.

The students meet weekly with Dr. Mazalek as a team to discuss the project status and what needs to be done. Milestones are set by the group, but just as in any research laboratory, sometimes the timelines for these goals need to be shifted. Every few months a significant milestone in the research is reached and the group steps back to evaluate future steps. Such meetings emphasize teamwork.

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## Student Profile: Rodolfo Camacho, MSE

### Georgia Tech student does research at MIT

Rodolfo Camacho came to United States from Mexico specifically to pursue an education at Georgia Tech. This 3rd year MSE student knew that he wanted to do research and was ready to dive right in. Over the summer, Camacho participated in a 10-week summer REU (Research Experience for Undergraduates) at MIT. Out of approximately 400 applicants, Camacho was 1 of 14 students selected to participate in this program.

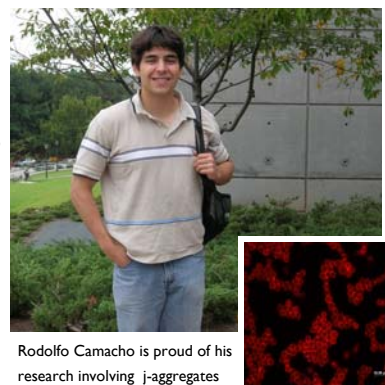
At MIT, Camacho worked with the Laboratory of Organic Opto-electronics (LOOE) group, whose research involves organic opto-electronics. Camacho was already familiar with this renowned group before going to MIT because he'd read about their research. Initially,

he was a little nervous about working with his mentor, Vladimir Bulovic, graduate student Yaakov Tischler, and others in the group. But Camacho's feelings of anxiety quickly dissipated after realizing that Dr. Bulovic was truly interested in molding him into a great researcher.

Camacho's research at MIT involved working with j-aggregates and whispering modes. J-aggregates are used for achieving whispering gallery modes (which occur at particular resonant wavelengths of light for a given droplet size) for coupling between light and matter. Through the coupling of light and matter, the photonic applications could increase their efficiencies through a smaller input of energy, higher efficiency, and

lifetime. Microspheres coated with these organics could be used to create bomb detectors, screens (for multiple purposes), and light emitter diodes.

Camacho understands that although you learn a lot doing research at Georgia Tech, "you broaden your horizons and you're capable of seeing more and more" when seeking opportunities outside of Tech. It is quite apparent that Camacho is deeply engrossed in research, and to de-stress, he takes time out for Tai chi. He is also active in campus organizations such as the Spanish Speaking Organization (SSO), Society of Hispanic and Professional Engineers (SHPE), and National Society of College Scholars (NSCS). Camacho believes that "everything is about the atti-



Rodolfo Camacho is proud of his research involving j-aggregates (pictured at right).

tude...every mistake is a new discovery in research." He advises students to never get discouraged when doing research because it's all about trial and error. With his passion for research and winning attitude, Camacho will definitely go far. He hopes to one day own his own company.

### COS student is winner ...cont'd from page 1

Dalton appreciated the fact that Dr. Riley established high expectations and never underestimated his abilities. Dalton's research was so promising that Dr. Riley encouraged him to participate in the College of Computing's Spring Symposium.

To Dalton's surprise, he won first place. Although Dalton was nervous about presenting his work at the symposium, he was

grateful for the experience. He says the experience increased his confidence level and enhanced his public speaking skills. Most of all, Dalton was impressed by the feedback that he received.

In addition to participating in the COC symposium, Dalton submitted his research to MAS-COT, an organization that holds conferences pertaining to literature on networking and

network simulation models.

The one piece of advice that Dalton would give to students interested in research is "Plan, Plan, Plan." He realized during the research process that detail planning is critical when collecting data.

Steven Dalton is currently finishing up his physics degree and plans to pursue a second B.S. degree in computer science.

After graduation, Dalton would like to obtain his Ph.D and become a professor. He says that he wants to "inspire someone to do research" just like his mentor.

## RPGs and Research ...cont'd from page 5

Each student felt that they had gained something uniquely valuable in their work on the project. Dana was involved in heavy computer programming on the effort which went beyond her classroom experience. She also learned how to manage time and tasks. Nigel remarked that "standard courses sometimes lack creativity." This opportunity provided a means to work with others in a creative setting. Basil felt the opportunity would allow him to explore his interest in usability testing and developing protocols for such testing. For example, he should be able to test what avid role playing gamers think about the system.

Elijah used a President's Undergraduate Research Award (PURA) to fund his work in the laboratory over the summer. He sees the benefits in learning via a long-term, consistent research project. Elijah's number one piece

of advice to other students is to find a project that they like. He commented, "You need to be able to focus enough to pull your weight".

Dr. Mazalek began her research career as an undergraduate student in a graduate computer science lab working on multimedia interfaces. The experience greatly influenced her career path. Her advisor became a "long-time mentor and friend." Mazalek is pleased to be able to provide the same opportunity to a new generation of young researchers. Mazalek describes undergraduate researchers as "very enthusiastic" becoming "...very engaged in the work, often bringing new perspectives and ideas for ongoing projects and research themes from the outside." She goes on to comment that working with undergrads is also a great way to get extra hands for research projects in the lab. Mazalek feels "Georgia Tech has very tal-

ented undergrads with a broad range of skills across many disciplines. They're competent, creative and hardworking!" When asked why she felt undergraduate research was important, Mazalek commented, "as an undergrad, it's hard to know what's involved in academic research without being somehow engaged in it. By bringing undergrads on board our research projects as faculty, we can get them excited about research early on and give them a chance to consider research as a potential career path."

Future plans for the undergraduate student group members include paths as different as their personalities and interests. Dana felt that her research experience was key to her obtaining an internship at Lucas Arts (yes, the Lucas of Star Wars fame) as a game play engineer. She coded pieces of the new Star Wars game and hopes that this real-world experience will translate into a full-time

position. Basil is interested in going to film school. Nigel is planning to travel to Japan to teach English. Elijah will work on finding an internship with a production studio (and completing his B.S. degree). These students will most likely agree that research is all about "playing games"!

Sound interesting? Visit the SynLab website at: <http://synlab.gatech.edu/>.



TVViews Table Role Playing Game Application

## New Student Undergraduate Research Advisory Group

An advisory group made up of Georgia Tech students who will provide input to the Undergraduate Research Opportunities Program (UROP) held its first meeting on Friday, October 20, 2006. The group will also be involved in publicity of specific programs and events and may even take on

special projects chosen by the membership. The group will meet, as necessary, 2-3 times per semester during fall and spring.

### Members of the group for 2006-07 are:

- Farhana Abdullah (LCC)
- Arish Alreja (ECE)
- Angela Bailey (BME)

- Steve Dalton (COC, Physics)
- Robert Diamond (COA)
- Justin Harper (COM)
- Greg Leo (ECON)
- Trevor McLeod (ECE)
- Nirmal Patel (COC graduate student)
- Nikta Pirouz (Psych)
- Ander Steele (Math)
- Subina Surendran (student)

liaison from URAG)

If you have interest in participating in the future or have suggestions for the group and UROP program, please email [urop@gatech.edu](mailto:urop@gatech.edu). Watch for further information on the UROP website related to projects that the advisory group may sponsor.

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## Undergraduate Research Opportunities Program (UROP)

Fall semester brings a “buzz” to the air at Georgia Tech! New and returning students, new faculty, and a new year of opportunities in undergraduate research. Over 95 students attended information sessions sponsored by the UROP program at the end of August. Several students from biology and computer science are on course to graduate with the research option in December. We also welcomed to our staff in late June Project Coordinator, Ms. Fadrika Prather, who I’m hoping that many of you will get to know in the coming months. New members have joined our faculty advisory group (see page 3) and a Torchbearers Network has been set up to aid in promoting undergraduate research participation at the school-level.

This year we kick off our Research Workshop series (see page 2). Watch the website for additional sessions to be added in the spring. A student advisory group met for its kick-off meeting on October 20<sup>th</sup> (see page 7). We also hope to expand and improve our spring undergraduate research symposium on campus.

Be watching for new things every month!

Best,

Karen Harwell

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

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**Georgia  
Tech**



## Undergraduate Research Opportunities Program



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

***[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"