

Volume 2, Issue 2, Spring 2008

VIEW FROM THE DEPARTMENT CHAIR

RINGFIELD.

After all the work the department did in the fall semester hosting the Fall Meeting of the Ohio Section of the Mathematical Association of America (MAA), things slowed down a little bit. We had a record number of students participating in the annual Four College (Math) Contest in February and later on in the 19th annual program contest at Denison University. Though it's been a number of years since Wittenberg participated in the latter event, Steve Bogaerts, who completed his first year as an Assistant Professor of Computer Science, organized our renewed participation. Details of both events are given in this newsletter. We also had a number of students attend the Spring Meeting of the Ohio Section of the MAA at Marietta College. Our computational science program under the direction of Eric Stahlberg is growing nicely; you'll find a list of computational science internships in this newsletter. With Wright-Patterson AFB just down the road and with the opening of the NextEdge research park in Clark Country, there are plenty of opportunities for student internships. And of course there was still plenty of teaching to be done, so much so that we needed six part-time adjuncts to cover all of our courses (a record high for us).

We got off to a late start but we were successful in finding a full time visiting position to replace Bill Higgins who will be taking a sabbatical/leave of absence next year (in California!) Don Mills, who comes to us from Illinois State University, will be Bill's sabbatical replacement. Interestingly enough, Bill knew Don when they were both at West Point during Bill's last sabbatical leave. I expect you're hear more about Don in the Fall newsletter.

Enjoy reading about the news of the department. Thanks to everyone that have sent in news about yourselves as we love hearing about our alumnae. And those that haven't written, please consider dropping us an e-mail, telling what you've been up to.

Brian Shelburne

IN THE SPOTLIGHT: ALYSSA ARMSTRONG IN BUDAPEST

Alyssa Armstrong '09 spent the spring semester of her junior year studying mathematics abroad in Budapest, Hungary. Here she talks about her experiences!

I remember the first time I heard about the Budapest Semesters in Mathematics program. I was on my way home from spending a weekend at the Ohio MAA Spring Meeting. Just a freshman, I somehow ended up stuck in a van with five math professors, who gave me advice about my



Alyssa Armstrong hiking along the Danube Bend.

remaining three years at Wittenberg. It was Dr. Higgins' wife, a math professor at the University of Dayton, who first suggested that I should look into the program. I had always wanted to study abroad, so as soon as we arrived back at Wittenberg, I searched online for information. After reading some testimonies from past participants, I decided that I was going to study in Budapest.

The Budapest Semesters in Mathematics program is one of the most prestigious undergraduate study abroad programs in the world. Initiated by Hungarian mathematicians,

Paul Erdos, Laszlo Lovasz, and Vera T. Sos, the program provides American undergraduates the opportunity to study under brilliant and distinguished scholars and professors. As the BSM program website states, "The instructors of *Budapest Semesters in Mathematics* are members of Eotvos University and the Mathematical Institute of the Hungarian Academy of Sciences, the two institutions

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Computational Times

In the Spotlight (cont).

known for having educated more than half of Hungary's highly acclaimed mathematicians." The program not only emphasizes the acclaimed mathematics education, but also the cultural experiences and opportunities available to students who normally cannot go abroad.

Two years after my decision to apply to the BSM program and after much planning, I was accepted into the Budapest program. During those two years, I somehow managed to convince the math department that I had enough credit to take elective math classes while abroad, the study abroad office to accept this new program, and, most importantly, my parents that I was mature



enough to spend five months in a country 5,000 miles away. After finishing the fall semester at Wittenberg, I spent my Christmas break reading information about Hungary and packing the essentials for my semester-long journey.

January thirteenth soon arrived, and before I knew it, I had landed in Budapest and was riding in a shuttle on my way to my apartment. The first few days were pretty tough, especially since I was right in the middle of a huge metropolitan city in which I spoke no Hungarian. Each day had its ups and downs, including meeting new people in my program, frying my computer power cord, living without electricity or hot water for two days, and enjoying the Hungarian pastries. But, I think the best way I adapted to Budapest was the two week intensive Hungarian language course I did. I spent eight hours a day with other students in my program learning the basics about the difficult Hungarian language. I finished the program knowing survival phrases such as, "Bocsánat, beszelek angolul" ("I'm sorry, I speak

Students and Professors of the Budapest Semester of Mathematics

English") and "Hol van a pályaudvar?" ("Where is the train station?"). Some of my closest friendships were formed during those two weeks, and I felt a little more confident wandering around the city.

The actual math program began in the beginning of February, and by that time, I was excited about learning math instead

of Hungarian. During the first three weeks, we had the opportunity to sit in on any class we liked in order to determine our course load. The program offered classes covering almost every field and difficulty, so I sat in on eight classes before settling on Abstract Algebra, Combinatorics, Number Theory, and Hungarian Art and Culture. I was not only interested in these subjects, but I also really enjoyed the professors and the atmosphere. All of the classes were taught in English, but each professor taught the class in their own style. One feature of the program that was heavily stressed was practicing problem solving, which really helped balance out the extremely theoretical lectures. In my opinion, the classes were much more difficult than classes at Wittenberg, but I left Budapest with knowledge about topics I might not have been exposed to until graduate school. I was challenged mathematically, but, more importantly, I enjoyed the difficult material I was learning.

Just as I had hoped, I was able to balance an intense semester of mathematics with the fascinating culture surrounding me. I had the opportunity to travel to many European cities and experience other similar cultures and some very different cultures from my own. There were



Parliament and the city center.

times when I felt as if my whole experience was a dream, and I saw myself grow and mature over the five months I spent abroad. I left Budapest in May with fifty friends and acquaintances, two hundred twenty-five hours of math knowledge, hundreds of photos, thousands of stories, and most importantly, one of the best experiences of my life.

To read more about my trip, you can go to my blog at http://hungaryformath.livejournal.com/. If you are interested in learning more about the Budapest Semesters in Mathematics program, log on to www. stolaf.edu/depts/math-old/budapest/, or send me an email at s09.aarmstrong@wittenberg.edu.

Computational Science: A Bright Light

Wittenberg's pioneering computational science program received major boosts in publicity and opportunities this school year. Our COSC program went statewide at the start of the semester through a new collaborative virtual minor program coordinated by the Ralph Regula School of Computational Science (RRSCS). RRSCS is a virtual school; it is the collaboration of nine Ohio colleges, the Ohio Supercomputer Center, the Ohio Board of Regents and the Ohio Learning Network. This virtual minor provides Wittenberg students with an even broader range of computational science opportunities to blend with their on-campus experience.

This semester Wittenberg was also a co-sponsor of the second annual Ohio Collaborative Conference on Bioinformatics (OCCBIO). This conference was billed as an opportunity to connect Ohio's bioinformatics and bioscience research leaders. Wittenberg's Director of Computational Science, Eric Stahlberg, was one of the sponsorship chairs and was also a member of the conference's steering committee. Wittenberg student Fadi Michael '08 also made a presentation during one of the conference's poster sessions. "Bridging communities of expertise is essential to continued progress in the evolving fields of computational biology and bio-informatics," Stahlberg said. "The combination of the different backgrounds offer the perspectives needed to innovate as the different disciplines first begin to blend."

Currently, Eric is working to set a direction for computational science at Wittenberg, with a focus on creating applications across disciplines. He hopes to build upon the congressional funding earmarked for collaborative research efforts between Wittenberg, Wright-Patterson Air Force Base, and OSC that was announced in 2005, as well as the Course, Curriculum and Laboratory Improvement grant program funded by the National Science Foundation that was announced earlier this year. The integration of computational science with diverse academic disciplines is something that is "distinctively Wittenberg".

Wittenberg has been a forerunner in the area of undergraduate computational science for years and was one of the first in the nation to offer a formal program in it, inspired by the work of Professor Emeritus of Computatal Science, Jim Noyes. He was instrumental in the development of technological resources at Wittenberg in the 1990s, long before computational science was on most schools' educational radar. Virgilio Barrera '10 says "Computational science at Wittenberg has a very exciting future. We were one of the first colleges to realize its potential, and right now we are also making large strides in the field and shaping its future."

Record Numbers of Students Compete

This year, Wittenberg had strong participation at three different student competitions.

In December, nine Wittenberg students participated in the William Lowell Putnam Mathematics Competition, the largest and most prestigious mathematics competition in the United States. Over 2000 students across the nation take this extremely difficult six hour exam; typically the median score is 0 or 1 point (out of 120). This year, two Wittenberg students scored on the exam. Last year 11 students took part, and we hope to see the trend of strong participation continue.

Wittenberg had twelve students participate (including two freshmen) in the Four College Contest in February. Held at Denison University, the annual competition allows students the opportunity to face off with more than 50 students from Ohio Wesleyan University, Denison University, and Kenyon College. The location of the competition rotates among the four schools, and students collaborate in three-person teams to try to solve 10 math problems in two hours. "We try to keep it as low-key as possible and give students a chance to meet and socialize with like-minded students from other schools," said Dr. Adam Parker. "Having fun is the primary goal, and I believe we accomplished that goal."

Not to be left out, the Computer Science students competed in the 19th annual Denison Programming Competition along with 11 other schools from across Ohio, Michigan, NewYork, and Pennsylvania. Wittenberg brought 3 of the 21 teams, and their 9 students were among the highest of any schools participating, again showing strong commitment from our students and a competitive spirit!.

COMPUTATIONAL SCIENCE INTERNSHIPS

Rebecca Atkins '10 University of Michigan – bioinformatics

Molly Tingley '10 Nationwide Children's Hospital – imaging and biopathology

Jason Barkeloo '10 Future Path Medical, LLC – medical device development

Melissa Cederqvist '10 Wright Patterson AFB – computational chemistry

Janelle Mahowald '10 Wright Patterson AFB –computational chemistry

Adeline Brym '10 Wright Patterson AFB - computational chemistry

Jessica Brewer '10 Wright Patterson AFB – scientific animation

Molly Dannaher '10 Wittenberg – virtual environments for science

Laura Linden '08 Wittenberg – computer graphics in virtual environments

Nam Vu '10 Wittenberg – modeling comparing US and Chinese economies

FACULTY NOTES

Doug Andrews: I had a blast last semester teaching our new course on Statistical Design. (I hope the eight students who took the course had a good experience, too!) Now that the school year is over, I'm gearing up for the huge Joint Statistical Meetings in early August, held in Denver this year. My proposed presentation on how to structure effective long-term group projects for intro stat courses has been accepted for a special contributed topic paper session sponsored by the Stat Education section of the American Statistical Association. On a personal note, I just got back from two weeks of hiking in the hills and dales of northern England, and I'm about to take a 9-day bike ride along the Great Allegheny Passage and the Chesapeake & Ohio canal – essentially from Pittsburgh to Washington, D.C.

Steve Bogaerts: This past semester has been full of new experiences and challenges. I taught the senior seminar course, covering various software engineering concepts and practical workplace issues, while guiding the students through the development process for a web-driven medical image database. The project was based on virtual microscopy research at Children's Research Institute (CRI), a part of Nationwide Children's Hospital in Columbus. I am now in the midst of a 10-week externship at CRI, gaining experience in various technologies and the software engineering process, which will be very valuable in teaching future courses at Wittenberg.

I wrote a paper with my former graduate advisor from Indiana University, David Leake, which has been accepted for both presentation and publication in the conference proceedings of the 9th European Conference on Case-Based Reasoning. The prepublication title of the paper is "Formal and Experimental Foundations of a New Rank Quality Measure". The paper discusses a novel measure for comparison of retrieved case lists in case-based reasoning systems.

Bill Higgins: My term as president of the Ohio Section of the MAA ended at the spring section meeting held April 11-12 at Marietta College. One of my final duties was to give a one hour "retiring president's address." My talk, entitled "Insights from Archimedes" was about Archimedes' connection to the foundations of the calculus and how a medieval prayer book called the Archimedes Codex (see <u>www.archimedespalimpsest.org</u>) which contains a faint copy of Archimedes ancient work, had disappeared for generations, and reappeared in 1998 when it was sold at auction for over two million dollars. Three students – Marshall Zarecky, Brenna Noll and Brian Ervin also attended the meeting where Brian gave a talk in the contributed paper session. I hope as many or more will go to the spring meeting at Bowling Green next spring!

During the 2008-09 school year, I will be on leave at California State University Channel Islands. My wife, Aparna (who teaches at the University of Dayton) and I will each teach one semester and be on sabbatical the other semester. CSUCI is not actually on the Channel Islands but is on the mainland near Camarillo which is about half way between Los Angeles and Santa Barbara. Our son Vijay will be with us and will be a sophomore in high school. Our older son, Prakash, recently graduated from Springfield North High School and will be attending Kenyon College in the fall.

Adam Parker: This spring was very rewarding professionally for me. In the classroom, I had the opportunity to teach a topics course in Computational Algebraic Geometry. This is closely related to my research area and I thoroughly enjoyed teaching the course. Part of the grade required the students to present a poster on an application of Algebraic Geometry. The poster session was a lot of fun, with projects from sudokus to molecular modeling to number theory. I'm writing a paper using some of the methods from the course that I hope to submit this summer and I've written a module for the Computational Models and Methods (Comp 260) class describing some of the methods I presented.

This spring I had my third year review in front of the Personnel Board. This is when Wittenberg gets to weigh in on my prospects for tenure. I'm happy to say after a flattering letter from my department that the review went well.

This summer I look forward to attending the Ohio Mathematical Association of America summer short course on "Using primary sources in your teaching" at Xavier University. The course will hopefully describe how to infuse my classes with some original mathematics papers in an attempt to motivate and give context to what I teach.

Nancy Saks: In the spring of 2008, I continued my year-long sabbatical, focusing on game programming and open-source software. The game programming was aided by my work with senior computer science major Nick Kovach, who was doing an independent study using Microsoft's XNA Game Studio. XNA games can run on both a PC and the Xbox 360, which I purchased especially for these projects (thereby thrilling my son Jeremy!). I also attended a conference on Gaming and Teaching: Virtual Environments for Liberal Education in Bryn Mawr, PA, in March.

For the work on open source, I've been exploring both Joomla and Drupal, which are content management systems for web sites. Jeremy and I are working to develop a series of sites for county-level political parties.

I've also been working to develop our new course for the fall, Comp 290, Databases and Web-Based Computing, as well as thinking about our new spring course, Comp 253, Principles of Software Design.

Eric Stahlberg: Computational Science. What's that? Easily confused with it's close cousin computer science, computational science builds upon computer science by joining computer science, math and real applications to explore new frontiers, advance inquiry and literally change the world. While computer science focuses on making the computer more effective, computational science for

FACULTY NOTES (cont.)

cuses on making people more productive using the computer. It all works together.

Computational science at Wittenberg continues to grow. This summer, interns are working with researchers at Wright-Patterson Air Force Base in areas of scientific visualization and computational chemistry. Others are working with Nationwide Children's Hospital in Columbus and the University of Michigan examining opportunities in bioinformatics and health information. An-

other is exploring economic relationships between the US and China using computational modeling. In each case, Wittenberg students will be changing the world with their contributions.

With eager anticipation, Wittenberg will also greet its first Choose Ohio First scholars in bioinformatics this fall. The scholars arrive at Wittenberg the result of a successful bid to secure scholarship support of \$4700 per year for students interested in bioinformatics related majors and computational science minors. Opportunities exist for junior and senior students as well, so if you are interested, please contact Dr. Stahlberg.

Al Stickney: I thoroughly enjoyed being back in the classroom this past year after my 2006-07 sabbatical leave. We had a total of 9 students take part in the Putnam Exam in December. That was an outstanding turnout for a school of our size. We also had 9 students compete in the Four College Contest in February. We will be hosting the Four College Contest at Wittenberg next year.

During spring semester I was pleased to have the opportunity to direct an independent study in Number Theory. I also attended Adam Parker's Topics course on Computational Algebraic Geometry. I thoroughly enjoyed that as it was a chance to learn about some mathematics that was new to me. Because of Adam's course and because I was teaching multivariable calculus, I finally **CONGRATULATIONS!** decided it was time to learn a little something about the computer program Mathematica[®]. I'm still a "beginner", but at least I can use The Department would like to congratulate the following stuit on my own now. Even more importantly, I know how to find the "HELP".

This summer I'll be traveling to northern Michigan and to central Pennsylvania for short vacations. I'm looking forward to next year when I'll direct another independent study, this time in Rings and Fields, and I'll have an opportunity to teach a Topics course of my own during the spring semester.

Brian Shelburne: I spent the Spring semester teaching Comp 150: Computer Programming I in Python and Comp 370: Computer Graphics. The former was essentially a new course for me since previously we taught Comp 150 using C++. It is interesting to note that Python is the *fourth language* I've used in an intro computer programming course. Python makes for, in my opinion, a more gentle introduction to computer programming as it is more powerful and we can certainly do more in the course. By the way, the language was named after Monte Python's Flying Circus since its designer, Guido van Rossum, is a big fan.

This summer I'll be working more on the CCC (Collaboration, Competency and Cases) Math Partnership Grant that Wittenberg has with the Tecumseh School district (Clark County). In June I'll be team-teaching (with Gina Post of the Education Department) a course on "Number Sense" for elementary teachers. In August I'll be teaching a week long course titled Ten Mathematical Themes which aims to increase the mathematical background of elementary school teachers. The latter will be a revision of the same course I taught last summer.



Drs. Stickney, Higgins, Andrews and Parker relax at the Five College Competition at Denison.

dents who have won our departmental awards.

Paul Hessler Award: Alyssa Armstrong Danny Marous

Richard A. Little Awards: Brian Bennett Shannon Cooper Emily Emmons Brian Ervin Indraroop Roy Mohanti

> The Calculus 202 Award: David To

Math Department Book Awards:

Brandon Bock Jason Evans Daniel Hall Brian Morrow Kate Snead

Thomas DeBell. Amanda Furness Sarah Kendrick Sandra Renz Paul Weber

In addition we would like to congratulate all the other majors and minors that were inducted into the various honor societies and won other departmental awards. We are proud of you.

ALUMNI NOTES

Lanty Smith (math '64) was recently named chairman of Wachovia, the fourth largest financial services company in the U.S., where he has served on the board for more than 20 years and is the lead independent director. Lanty has long supported his alma mater, serving on our Board of Directors and establishing the prestigious full-tuition Smith Scholar program, and he credits much of his successful and rewarding career to his Witt liberal arts education.

Rodney Hopkins (math '99) is teaching math at Thomas Worthington High School in Columbus and coaching football at Otterbein College. "I married my beautiful wife Lisa last September and since I coach football we were unable to honeymoon then, so we are heading to Maui [in June] for a week. Also this summer I will begin working on my masters at Ashland University in Sports Science."

Jaime (Timmons) Boysel (math '00) taught math at Northwestern HS here in Clark County for a few years, and has been teaching 8th grade math for a couple years at Rockway Middle School, also in the Springfield area. She and husband Jim have two kids: Lukas James Boysel, born on June 30 '04, and Nathaniel John Boysel, born on July 14 '06. Next year she will switch gears from teaching and will be a stay-at-home mom.

Alex Nichols (comp '02) is "currently working with AAI corporation in Maryland as a Software Engineer. AAI is a government defense contractor. Been doing some international travel recently for some of the contracts. Anyway, please feel free to give my information to other Engineers who might need me to submit a resume for them. We are based in Hunt Valley, Maryland."

Curtis Mears (math '03) is still working for the US Army Special Operations Command at Fort Bragg, North Carolina, but has been on sabbatical to work on a Masters Degree in Operations Research at North Carolina State University. "I will graduate in December. My wife Michelle (also a Witt grad) and I welcomed our daughter, Lucia Nadine to the family in December '07 - that brings us to a family of 4, plus the dog."

Mike Southard (math '04) and **Jackie Comer (math '05)** celebrated their 2nd wedding anniversary in June, and are living in Beavercreek, Ohio. Mike had been working in management at Applebee's but is now applying to a program to get a teaching license in time to teach high school math in fall '09. Jackie just finished her 3rd year teaching at Beavercreek H.S. Next year she begins teaching Geometry, Algebra and Pre Calc. She is also taking classes towards her Masters this summer and will finish at the end of next summer at the University of Cincinnati.

Gerri Woessner (math '04) got a job as assistant track coach in West Virginia after Witt and took advantage of that position to take MBA classes and get that degree. Since then, she's been working in the financial sector in the Dayton area, though she's thinking about dusting off the books and going back to grad school in math.

Katie Joseph (math '03) is still working in statistics with the federal government, but recently switched from the Office of Personnel Management to the Department of Energy's "Energy Information Administration". Her current project is with the Commercial Buildings Energy Consumption Survey. She's eager to help out current Witt students, so if anyone is interested in a summer internship doing stat-related work in DC, get in touch with Katie. (Ask Doug for details.) She and her boyfriend had a great time in New York City recently, touring the NBC studios, seeing tapings of the Colbert Report and Conan O'Brien, and enjoying some great food.

Natalie Coakley (math '07) will be moving back to Ohio from Charlotte, North Carolina to teach Geometry at Xenia High School. She is very excited to be moving back home!

We'd love to hear from any departmental alums. Please take a few minutes to drop a line to dandrews@wittenberg.edu to let everyone know what you're up to these days. And are there some fellow alums you'd like us to help track down? Send us a few leads, and we'll do our best to help find your old buddies. Thanks!

Problem Corner

There were no correct solutions last newsletter, so lets try it again!

Let *m* be the least common multiple of the integers 1, 2, 3, ..., 2006.

Find *k* so that *km* is the least common multiple of the integers 1, 2, 3, ..., 2007 and prove that your answer is correct.

Send your answers to whiggins@wittenberg.edu by Nov 30, 2008. We will randomly select one person from all correct entries to win a home-made cheesecake from Dr. Higgins!

MAJOR NEWS

GRADUATING SENIORS

Emily Emmons has earned a graduate assistantship to Miami University (of Ohio) where she will obtain her Master's degree in Mathematics.

Brian Bennett is working in Washington D.C. for GEICO Insurance. "Everything is going real well and I am definitely enjoying it."

Indraroop Roy Mohanti will be moving to Wisconsin for a position with EPIC systems, a company specializing in Electronic Medical Records and security.

Nicholas Kovach will attend graduate school at the Air Force Institute of Technology (AFIT) where he will pursue studies relating to computer security.

Mark Lintern started a job at Q-base in Springfield, Ohio.

Brian Ervin completed a research project on Pascal's triangle. He discovered a novel way of generating a pattern using functions. He originally came up with the idea as a freshman in Dr. Shelburne's WittSem on fractals . Later, he wrote a program implementing his functions in Comp 150, and presented his results in a talk at the Spring Meeting of the Ohio MAA at Marietta College.

CURRENT STUDENTS

Hannah Scherger has an internship with the Air Force Institute of Technology in their nuclear engineering department.

Alyssa Armstrong spent the last semester in an intensive mathematical experience in Budapest, Hungary. You can read all about her experience IN THE SPOTLIGHT on pages 1 and 2. Upon her return to the states, Alyssa will spend the summer tutoring at Mathnasium, a big tutoring center near her home. "I realized that I needed time to acclimate back into the U.S. culture, study for the GRE, look into grad schools, and maybe learn some more combinatorics or another topic."

Marshall Zarecky is spending his summer learning Spanish, reading some Ring theory for a fall independent study with Dr. Stickney and working on a research project with Dr. Parker. The research project will use Groebner basis techniques from Dr. Parker's Spring topics course to analyze the number of solutions to a certain combinatorical problems.

Paul Weber is attending a Research Experience for Undergraduates (REU) at Texas A&M University.

Amanda Furness is attending an REU at Louisiana State University. "There's a total of 12 students, 2 professors, plus 4 graduate students helping out. Last week we had two lectures per day to introduce us to the kind of material we'll be working with. Those were pretty intense and overwhelming. Then on Saturday we got to pick which area we wanted to do our individual research in. I chose skein modules of knot complements, and my specific problem is: compute the automorphism group of the skein module of the punctured torus. I'm still not completely sure what that means, but I'll figure it out."

Danny Marous is attending an REU at NC State in Raleigh. In it, his team will "develop mathematical models for tissue regeneration in articular cartilage."



Students (and faculty) enjoy pizza and pie at π -day on March 14th.

Look for research reports from all of our REU and internship students doing in the coming Newsletters.



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Postage

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