AUGUSTANA

DEPARTMENT OF MATHEMATICS

SPOTLIGHT ON TWO AUGUSTANA GRADUATES

Recent Alumni Ph.D.

Over the years several of our students have continued on to earn a Ph.D. in Mathematics. Now, naturally this is exciting whenever it happens! So, we are spotlighting one of our most recent Ph.D's, Jonathan Rogness. Rogness graduated from Augustana in 1998 with a triple major: German, Computer Science, and Mathematics. Of course, we were happy that he chose to continue on in Mathematics. But it was not exactly, at the time, a pure mathematical journey that he was starting. Jon had received a Fulbright Scholarship to study in Germany for a year. Thus he managed to find a cross-over involving all three majors with a plan to study numerical analysis, the prime intersection of mathematics and computer science, in the

Jonathon Rogness

German language!

However, fate or destiny changed his hand a bit. Upon arriving at the University of Erlangen, Jon found that his academic advisor at the school had taken a sabbatical leave. The change of direction moved him from numerical analysis to algebraic topology, and his new path was set. He was converted to pure mathematics, and of all possible areas, one of great abstraction.

Following his Fulbright year, Jon began graduate study in the School of Mathematics at the University of Minnesota. In 2005 he successfully defended his Ph.D. thesis: "Homotopical and Homological Algebra of Exact

National Educator Award Presented to a Math Teacher

Last October, Augustana alumna Kira Christensen (2004), a math teacher at Washington High School (WHS) in Sioux Falls, was awarded the 2009 Milken Family Foundation Educator Award. Christensen was one of 53 recipients chosen to receive the national award. Her selection was based on her excellence in education, and apart from the honor of the award, she will be presented with a $25,000 award as well.

"I had no idea that I was nominated or

Kira Christensen

even being considered for an award like this," Christensen said. At a gathering of the student and faculty of WHS, she had expected the governor to announce that one of the many other deserving teachers was to be recognized. "I was just really surprised, excited and humbled by the whole thing."

Since receiving the award, Christensen has been even more motivated to encourage students in exploring mathematics. "The award really invigorated me to keep putting forth the effort to push

RECENT ALUMNI PH.D.
continued…

Couples."

Jon remained at the University of Minnesota in a post-doctoral position at the Institute of Technology Center for Educational Programs (ITCEP– now becoming MathCEP). After a time, whether he wore them out or impressed them at the center, he was hired as the Associate Director.

University of Minnesota Assistant Professor Rogness earned a bit of fame about three years ago. He and colleague Doug Arnold made an interesting video, *Möbius Transformations Revealed*, and posted it on Youtube.com. Just search for Moebius Revealed, and the video will be the first item listed. Then you can discover what 1.7 million people have looked at. For comparison, Lady Gaga has garnered 196 million hits; hence Jon's video is about 1% of a gaga.

Of his education at Augustana, Jon says, "Going to Augustana had a huge effect on me. Not only did I get a solid preparation for graduate school in mathematics, but it gave me a direction for my career. The 'Enter to Learn, Leave to Serve' motto resonated with me, and it's no accident that I have focused on activities where I feel like I can have a big effect helping students of all ages." Indeed, Jon's responsibilities emphasize educational outreach to middle schools. Lately he has been bringing spherical geometry and game theory to his students! He is also the main instructor for honors calculus and differential equations in the University of Minnesota Talented Youth Mathematics Program (UMTYMP), which is in its 30th year.

Here is a just a little about Jon's non-academic life. Jon was one of the founders of Augustana Ultimate Frisbee, he organized the Volleyball Club, and he served as an upper class mentor for New Student Orientation. He married another 1998 Augie grad, Tara Fagerstrom, biology major, in 2000. Tara works at the Springbrook Nature Center in the Twin Cities. They have two children, Nicholas (8.5325) and Matthew (4.5333).

Oh, according to the Mathematics Genealogy Project website, Jon and I are distant mathematical relatives, fifth cousins once removed, to be precise. Felix Klein is Jon's great-great-great-great-grandfather while he is my great-great-great-great-great-grand father, even though Jon is younger than I!

Timothy Sorenson

NATIONAL EDUCATOR AWARD PRESENTED
continued…

the envelope with my teaching."

Christensen said she has always found math fascinating and wants to inspire young people who have given up on math to give math another chance. Despite the challenges she faces in motivating students, Christensen continues to radiate encouragement to her students.

"Not everyone who walks into my classroom loves math." One of the classes Christensen teaches is Algebra 2, which for many of her students is the last math class they need to graduate. "I find my challenge is to get and keep the students motivated, and maybe even convince them they can enjoy themselves while they're at it." In her experience keeping her students motivated, Christensen said, "I don't think there's any one way to reach all of the students in a classroom, so it's necessary to use several methods to try and reach the students."

In order to keep math interesting in her classrooms, Christensen uses a variety of teaching methods. "I'm pretty dedicated to teaching with technology, which helps me keep things fresh."

Apart from using newer forms of technology to motivate her students, Christensen starts most days by doing an activity to help the students discover mathematical concepts for themselves. "One day we might start the day with an activity using the graphing calculator and another day it might be using rulers and graph paper to discover a new mathematical idea."

The students are what have truly inspired Christensen to make each day a new day of mathematical exploration. "Working with the students is probably the best part about teaching. There are all sorts of reasons that I decided to become a math teacher, but what keeps me teaching is getting to work with young people."

Receiving this award, along with the recognition from colleagues, parents and students, is an experience Christensen wishes every teacher could have. "The best part was hearing from students and hearing how much they appreciated my class, and that I really made a difference in their lives. That's the piece of teaching that keeps you going, and I'm so appreciative of all the people who took the time to write, call or email me to say thanks."

Peder Thompson

We'd love to hear from you about all your accomplishments and journeys as an Augustana Alum! Please feel free to contact:

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ARIE GAALSYWK IN MEMORY

Arie Gaalsywk, longtime chair of the Augustana Mathematics Department, passed away June 21, 2009 at the age of 91. Arie joined the Mathematics Department in 1960 and retired in 1983. Like all of us, he taught a wide variety of mathematics courses at Augustana. He was especially interested in applied mathematics, and helped many of you study for actuarial exams, work he continued to do for several years after his official retirement in 1983.

It was during his tenure that computer science became a field of study. Computer Science began as part of the Mathematics Department, but eventually became a free standing department. While Mathematics and Computer Science are still two distinct departments, six years ago the administration of them was consolidated into a single chair.

Those of us who were students in Arie's classes can fondly picture him at the chalk board with one hand wrapped around his head and the other pursing his lips as he contemplated a problem.

He was famous for his Yogi Berra like statements: you knew what he meant to say, but it just didn't come out quite right.

Arie is responsible for creating our largest endowed mathematics scholarship. He solicited funds from many of you more mature alums to create this scholarship, which has given support to many of you younger folks. The name of the mathematics scholarship was changed to the Dr. Arie Gaalswyk Scholarship in Mathematics several years ago.

Arie was a giant of a man and a significant influence in the lives of many of our alumni. His passing leaves us with a sense of loss, though his memory lives on. He will be missed.

Jay R Smith

UNDERGRADUATE RESEARCH

Peder Thompson (Math/English, 2010), one of three graduates of Augustana's Civitas program, has recently completed an independent project. His work, supervised by Dr. Martha Gregg, is based on the article *Discovering Binomial Identities with PasGaloisJE*, by Tyler Evans, which appeared in the mathematics education journal *PRIMUS* (Volume 18, Issue 4 July 2008, pages 361-369). Peder is using PascGalois, a software package (made freely available on the web at *http://www.pascgalois.org/*), to visualize

multinomial identities modulo p, where p is prime. He presented his work earlier this spring at Mathematics on the Northern Plains, an undergraduate conference.

Drew Doshier (Math/Economics, 2012) and recent graduate Nicole Winkler (Math/Music, 2010) have been conducting research on swarming, supervised by Dr. Tim Sorenson. Swarming is a natural phenomenon that occurs with some unusual characteristics

Augustana Students in National Contest

The Augustana Mathematics Department had its first team participate in the Consortium for Mathematics and its Applications (COMAP) modeling competition. The competition lasted from February 18th to the 22nd, during which the team of three members developed a model based on one of two offered problems. The team was then required to write a paper explaining the model and how it solves the proposed problem.

The team consisted of Thomas Alexander (junior Physics and Business/Communication), Trent Anderson (junior Chemistry, Mathematics, and Physics), and Peder Thompson (senior English and Mathematics). The problems from this year's competition were to develop a model to predict where the next murder of a serial killer would occur or to explain the "sweet spot" of a baseball bat. The Augustana team investigated the characteristics of the sweet spot phenomenon of a baseball bat. Thomas Alexander felt that the team "submitted a strong paper and [he] felt proud of what the team had accomplished in such a short time-span." The Mathematics Department is hopeful that next year there will be enough student interest to arrange two teams for the competition. The team thanks the Math Department and Science Division, which provided funds for the team's entrance fee.

Trent Anderson

UNDERGRADUATE RESEARCH
continued…

and forms. We observe in nature: 1-dimensional swarms embedded in 2-dimensial space (follow the leader), 2-dimensional swarms in 2-dimensional space (herds) and many others. The objective of this research is to analyze, in a basic way, how one would characterize swarms so that a mathematical model can be developed. The work examines the mechanisms needed, both physically and mathematically, to cause the formation of a swarm. The research team will consider both local and global aspects, continuous and discrete models, and questions involving the topology of the space involved.

Trent Anderson (Math/Physics/Chemistry, 2011), is the recipient of the Ralph and Susie Wagoner Student-Faculty Award as well as a grant from the South Dakota Space Grant Consortium. Both awards will fund his research in mathematics during summer 2010. Trent, supervised by Dr. Martha Gregg, will be constructing a mathematical model of the spread of a disease. In particular, he will use differential equations and principals of probability to model the expected course of a contagious illness on the Augustana campus. The model will incorporate known factors about transmission of the illness, and evaluate the effectiveness of the model based on its accuracy in modeling existing empirical data. Modeling software necessary for the research will be purchased by the mathematics department gift fund; thanks to all who have generously contributed to the fund.

Martha Gregg & Drew Doshier

LETTER FROM THE DEPARTMENT CHAIR

Hello! It has been a while since the Mathematics Department has sent out a newsletter, so let me just review a bit of the past and talk a bit about the future.

I am now Chair of the Mathematics & Computer Science Department and have discovered how difficult administration is! Deadlines, Deadlines, Deadlines: makes me feel like a student again.

Since I first arrived here in 1990, a lot has happened and changed. We have had seven faculty members leave or retire since my arrival. Retired are emeriti professors Dr. Dick Forman, Dr. Arie Gaalswyk, Dr. Verlyn Lindell, Dr. Orville Sigurdson, and Emeritus Professor Joe Pagone. Also having taught in the math department are Dr. Steve Haataja and Professor Kraig Pressler. Unfortunately professors Gaalswyk, Sigurdson, Pagone, and Haataja have since passed away.

Presently we have five Faculty serving full-time in the department: Emil Knapp, Jay R. Smith, Martha Gregg, Curtis Olson and me. On regular occasions we have Steve Shum from Computer Science teach our Discrete Structures course. Our most recent two hires are: Dr. Martha Gregg (UNL), the first woman professor we have hired on tenure track, and Dr. Curtis Olson serving as an Adjunct. Dr. Gregg is a great addition to the department and is serving in her second year. You could take pictures of her blackboards to keep notes. Dr. Olson came to us from USD and has been serving as a full-time adjunct. I can say with pride that we could not be happier with their service and ability!

Recently, we purchased a computer dedicated to student research and we have had two students and three presentations from our *"Swarming: the birds, bees, beasts and fish."* This project is expected to continue for some years to come. Nicole Winkler (2010) started the project as an integrated COSC/Math course. She learned Visual Basic and Algorithms just to begin the project; Drew Doshier (2012) has since taken the reins to write a *An Introduction to Swarming*, discussing the various aspects

FROM THE FACULTY

Well, time rolls along. Watching the recent Twins season opener I noticed the Minnesota players were sporting sleeve patches circling a big "50." I figured they must be honoring someone who used to wear that number. It couldn't be the fiftieth anniversary of anything, because when the team was formed I was already in college, so that had to be well under fifty years. Let's see, spring of 1961 then, 2010 now. Hmm, 2010 minus 1961 is 49. Uh oh, fiftieth season.

I'm still enjoying thinking about mathematics and sharing my thoughts with our students. Classes and office hours are good times, paper and test grading tolerable. A continuous supply of eager students, perpetually young, keeps everything interesting. Two new courses in the department have highlighted the last several years. I taught Foundations of Mathematics, our bridge between calculus and the advanced courses, the first five times it was offered, and Tim Sorenson and I have handled Quantitative Reasoning, our primary general education course, continuously since its inception.

I think everyone in the department has been boosted by the hiring of Dr. Martha Gregg two years ago. Martha is an effective teacher, a skillful facilitator of student projects, and a good colleague. Besides, for decades we have had as many young women as men among our majors, and now at last we have accomplished something in that direction within our faculty.

On the personal side, since I last wrote one of these notes my wife Carol and I have gained a daughter-in-law and two granddaughters. We visit the family fairly often in Des Moines, where son Peter works at Hy-Vee headquarters. Carol continues as secretary to the pastors of First Lutheran Church, and I do my part in church music. I remain active in sports, including racquetball and noon basketball. Two years ago I stepped up my triathlons to the olympic distances.

In early 2008 when we interviewed candidates for a new member in the department, the prospects were so appealing that the college

Department of Mathematics faculty pictured left to right:
Emil Knapp, Tim Sorenson, Curt Olson, Martha Gregg and Jay Smith

administration wanted to make offers to two of them simultaneously lest we lose one while the other was contemplating. The catch was that if both accepted, then we would be overstaffed, at least by some reckoning. To make the move safe, I offered to change to part-time if necessary. That was my first attempt at retirement. As it turned out, only one person accepted, and we failed to find part-time help, so I ended up back at full-time, plus one extra course. The heavy workload nudged me toward the idea of

complete retirement beginning Fall 2009, but procrastination staved that off and apparently has done the same for 2010-11. As the motto on my bulletin board says, "I used to think I was indecisive, but now I'm not so sure." I can't be putting off retirement indefinitely, though, because Jay Smith wants to enjoy reigning as the senior member of the department for at least one year.

Emil Knapp
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Greetings, it's been a long time since the last department newsletter (Spring 2003). Since then Arie Gaalswyk (June 2009) and Joe Pagone (April 2007) have passed away, Richard Forman and Verlyn Lindell retired, Kraig Presler gave up his head wrestling coaching duties and left to teach High School Math at Brandon SD, Martha Gregg came to us from the University of Nebraska at Lincoln, and Curt Olson (Retired Dept Chair of Mathematics at USD Vermillion) joined us as a full-time adjunct professor.

Time flies so swiftly. It is hard to believe that I am completing my twenty-fifth year as a member of the Augustana Mathematics Department. I served as Department Chair for ten years and then passed it on to Timothy Sorenson. It

of the subject; his paper will serve has a handbook for future students to pick up and work on a piece of this puzzle. To date we have incorporated recursive algorithms, computer programming, discrete mathematics, probability and statistics as well as basic modeling principles. Our goal is to foster a scientific methods approach within the framework of doing mathematics and to find connections between Math and other areas. Nicole presented her results in March of 2009 at the Univ. of California at Riverside. Both Drew and Nicole presented at *Math on the Northern Plains* this April at Morningside College, Sioux City.

Personally, all of my children are grown. If you had my upper division courses, you know I frequently asked on the final one of the following extra credit questions: name my children, the sports they play, or the names of our pets. Well, Nicole, the oldest, is married living in New York and working for Americorps. My middle child, Hannah, is off to Yale this fall, after graduating from St. Olaf, to do a Masters of Fine Arts in Acting. Lastly, my youngest Nevada is a hurdler/engineer, running/studying at Notre Dame. We expect her to graduate in 2013. My office still has stacks of paper, my homework still seems to come back late whether I have a grader or not, and I still seem to give 90 minute exams rather than the 50 minute ones. That seems to not have changed!

Timothy Sorenson
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FROM THE FACULTY CONTINUED

feels great each day when I find my mailbox stuffed full and I get to move most of it to Tim's box.

When not torturing students at Augie, I am still working on the new house I started building five years ago (We have been living in it for three years but the interior woodwork is only about half done). My greatest joy, though, is watching grandchildren grow: Johnathan (8), Isaac (5 and one-half), Alanna (Almost 4), and Aiden (1).

Retirement is not too many years off, but not immediate either. After all I'm only 65. I'll wait and see what Emil does, as he is ever so much older than I. If you feel so inclined write a limerick involving mathematics and send it to me. Cindy Kroon (aka Wicked Wackerly) still sends me "Smithmas" carols that her students write. Stop by when you are in town. We would love to see you.

Jay R Smith
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I am completing my second year (non-consecutive) teaching mathematics at Augustana. I came to the Augie mathematics department with many years of teaching experience including a ten year stint at Parker High. Realizing how much I missed teaching, I returned to the mathematics classroom in 2007 as a visiting assistant professor at Augie. After a one year hiatus as a fill-in at USD (where I was a member of the mathematics department for 24 years), I returned in 2009 to share the joy of mathematics with Augustana students. Having a grandfather by the name of Ole Olson, I really feel safe and secure at Augie with Ole watching over the campus. Following my promotion to professor emeritus at USD, I taught a couple years at Wayne State College. It appears that Favre has a few to go to catch up with this Scandinavian.

The Augie students are gradually adjusting to my mathematical puns and all-too-frequent mathematics "parties." What could be better than spending 50 minutes doing nothing but mathematics

and having no other thoughts and cares?

I live in southeastern Sioux Falls with my wife, Lynda, who *finally* got me to move to Sioux Falls in 2006. Two grandchildren who reside in Sioux Falls keep us quite active.

Curt Olson
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Since I'm "the new guy" in the department, allow me to begin by introducing myself: I'm Martha Gregg, and I joined the math faculty here at Augustana in the fall of 2008, shortly after completing my PhD at University of Nebraska-Lincoln. Prior to returning to graduate school I taught high school math and worked for the UNL math department as a lecturer for several years.

The best thing about being at Augustana is, of course, the fabulous students, who continually impress me with their work ethic and commitment to academic excellence. What a pleasure it is to work with such remarkable young people. My teaching duties in the math department have included, so far, Calculus, Differential Equations, Linear Algebra, Foundations and Real Analysis. As a change of pace, during January term this year, I taught a section of PE 100A titled *Introduction to Ballet*, and Christopher Stanichar (Augustana's Director of Orchestras) and I taught a course in history and appreciation of ballet and music written for the ballet.

Among the highlights of my first two years at Augie: In February of 2009, my paper On *C*-Extreme Maps and *-Homomorphisms of a Commutative C*-Algebra* appeared in the journal *Integral Equations and Operator Theory*. Last April I spoke at the Nebraska-Iowa Functional Analysis Seminar (NIFAS) in Des Moines. In June I became a Project NExT fellow, and my participation in this MAA program for early career mathematics faculty has been tremendously helpful; my thanks to both Mark Braun, Dean of

FROM THE FACULTY CONTINUED

the College, and Tim Sorenson, Math Department Chair, for their support of my application to NExT. I'm currently supervising the independent study of Peder Thompson (junior, Math/English), and this summer I'll be overseeing the research of Trent Anderson (junior Math/Physics/Chemistry). Peder and Trent also joined with fellow student Tom Alexander (junior, Physics/Business/Communications with Math minor) to enter a team in the annual Mathematical Competition in Modeling in February this year, for which I served as advisor. Their projects and the modeling competition are described elsewhere in the newsletter.

While I have been settling in here at Augustana, my family has also been adapting to life in Sioux Falls. My husband John, who worked in public radio before our move to South Dakota, has been enjoying a stint as a full-time parent and honing his already impressive cooking skills. Our daughter is now a sophomore at Lincoln High School, where her favorite activity is marching with their award-winning band. Our son started middle school this year at Patrick Henry but has not yet decided which he likes better: band, soccer, or skiing. My first two years here at Augie have been busy and fun; I look forward to many more.

Martha Gregg
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STAYING CONNECTED

Alumni for a Lifetime! The Augustana Alumni Association is here to help you maintain a lasting relationship with your alma mater. Through class notes, we help you stay in touch with your classmates. By planning alumni events, we give you the opportunity to gather with your Augie friends and to meet new ones. In sharing news, we keep you updated on how Augustana continues to impact the world.

You are always an Augustana Viking. Let your Viking Pride show—stay connected, keep in touch, and come home often! AugieLink is Augustana's Alumni Online Community.

What kinds of things can you do through AugieLink? Here are a few ideas: Send an email to your roommate. Discover how many Augie alumni live in your state. Post photos to your profile. Update your address. Read *Skol!* the Alumni Relations blog. Share your favorite Augie memory. You may also post your own Class Note to our new AugieLink online alumni community!

How do you get started? Contact the Alumni Office by email *alumni@augie.edu* to learn your personal identification code and begin using AugieLink to reconnect with your Augie friends today!

Looking for Augustana on other social media sites? Follow, friend, or link to Augustana through the many different social media sites the College currently uses. You can find us on:

Visit our own Augustana alumni community, AugieLink at *www.augielink.com.*

2010 MATHEMATICS ALUMNI FILE UPDATE

If you have accomplishments and/or changes in your life, we would like to know! Help us keep our alumni file up-to-date and take a minute to fill out the form below.

Name: _____
 FIRST   MAIDEN   MARRIED

Year Graduated: _____ Phone: _____

Address: _____

_____

Email: _____

Occupation/Place of Employment: _____

_____

Graduate/Professional School Preparation in Progress or
Completed: _____

_____

Personal News/Professional News you want us to know:

_____

_____

If you know of potential students for Augustana College, please provide us with their name, address and phone number so that we may contact them.

Name: _____

Address: _____

_____

Phone: _____

Name: _____

Address: _____

_____

Phone: _____

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Or email information to: *jay.smith@augie.edu*