

Summations

Department of Mathematics and Statistics Newsletter

Fall 1999



Dr. Douglas D. Smith

Last year **Dr. Douglas D. Smith** announced that he would be returning to full-time teaching and research within the department at the beginning of the spring 2000 semester. Congratulations are due to **Dr. Wei Feng**, currently assistant chair, who will be interim chair during the time a national search is conducted for a new chair.

"Summations" wishes to commend Doug Smith for over 16 years of service dedicated

Transitions

to the department and university. His blend of studying and teaching mathematics, collegiality and leadership, leavened with occasional humor, has enabled those in this audience to become better students, teachers, colleagues and leaders in turn.

Thank you, Dr. Smith!

Quotes from the Deans

There have been three deans of the College of Arts and Sciences during Dr. Smith's tenure as chair. They have contributed the following comments.

"**Doug Smith** has been the 'Chair's Chair.' The best orientation any new department chair in CAS could get was to spend time learning how he got things done. Many chairs have told us how generous Doug was in mentoring them. In the dean's office, we knew the wisdom of listening to Doug's thoughtful comments, occasional requests, and courteous counsel. We also learned to check his arithmetic especially after Doug

told the council of chairs: "There are three kinds of department chairs: those who can do arithmetic and those who can't."

~ Dr. Carolyn Simmons

I have always found him to be responsive to the needs and concerns of his department's students and faculty and scrupulously just and fair in resolving difficult situations. I admire his personal and professional integrity, as well as enjoy his wit and sense of humor. I will really miss having him at the head of this department, but I respect his wishes to step down after 16 years on the job. He has earned the rest from administration, and I know that he is excited about rejoining the faculty full time.

~ Dean JoAnn Seiple

"I was always impressed with the gracious and highly professional way Doug represented his department. He clearly served the department and university well."

~ Dr. Dan Plyler

Not Your Average Guy...



Carl Nelson tutoring STT 215 student Lila Thomas. (Spring semester 1999)

And speaking of average, that is, the statistical mean, students can find out all about this and more when they see **Carl Nelson** in the Math Lab. Many students

owe their success in STT 215, STT 262, PDS 217 and PSY 225 to Carl who has been tutoring our students since he retired in 1988. After retiring, Carl continued to teach mathematics and statistics in industry for the University of Maryland Extension Program for five years. At the same time he was assisting students with statistics on campus at UNCW.

His biggest enjoyment comes from helping students with problem solving and the one-on-one relationship he develops with the students who work with him on a regular basis. And how do the students feel about working with Carl?...

"I never would have made it through the course without him!" (STT 215 student)

"If I had come to see him sooner I might have gotten an A instead of a C!" (PDS 217 student)

His patience, knowledge of the material and willingness to spend extra time to help students understand the material all contribute to his AAA rating.

Carl says that students have the greatest difficulty with inductive reasoning and probability. They also struggle with translating verbal problems into mathematical and probabilistic computations to arrive at a solution.

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Congratulations to the Class of 1999!



*Front (left to right): Craig Kornegay, Shelly Crow, Darell Matthews, April Stephenson, Jennifer Dudley
Middle (left to right): Tom Casey, Greg Plow, Toi Graham • Back (left to right): Dana Tollis,
Shajuana Humphrey, Kevin Smith, Scott Baker, Alan Bass, Guoquiang Peng
Not pictured: Paul Fleshman, Emily Renee Johnson, Kathy Langone*

Student Awards

The following student awards were presented at graduation in May.

Adrian D. Hurst Award

The Adrian D. Hurst Award goes to the junior or senior mathematics major with the highest g.p.a. who has done all course work at UNCW. This year's recipient of the Adrian D. Hurst Award was **Rosa Turrisi Fuller**.

Barbara English Award

The Barbara English Award goes the graduating senior who has the highest g.p.a. **Craig White Kornegay** was this year's recipient.

At an awards ceremony in April the following students were named as departmental scholarship winners.

Adrian D. Hurst Scholarship

Lisa Albert Soberano – junior mathematics major

Rosa Fuller – junior mathematics major

Fred Toney, Jr. Scholarship

Scott Watson – junior double-majoring in physics and mathematics

J. Marshall Crews Scholarship

David Sutherland – sophomore mathematics major

Carl Nelson Award

Lauri Holland – junior double-majoring in mathematics and Spanish

Bookstore Scholarships

Deidra Suggs – sophomore majoring in secondary mathematics teaching

Shannon Koons - junior mathematics major

These awards are to honor the outstanding juniors or returning seniors in the Mathematical Sciences Department. Selection is made by a vote of the mathematical sciences faculty based on the students' academic achievements, extracurricular activities, and a short paper on the subject of the relationship between the students' education and career plans.

Congratulations to all!

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Carl doesn't only excel in the Math Lab. He is a championship horseshoe pitcher, winning local competitions and silver medals at the Senior Games in Raleigh. He and his wife, **Pattie**, enjoy bowling, playing bridge and square dancing. Around income tax time,

you can find him at the Senior Center working with VITA—Volunteer Income Tax Assistance program.

UNCW students are extremely fortunate to have Carl as a resource person because he is by no means an average guy!

MATH FUN

A bag contains some marbles of different colors: red, green, and blue. If one marble is randomly selected, it is known the probability it is red is $\frac{2}{3}$ and the probability it is green is $\frac{5}{18}$. How many red marbles are in the bag?

The first correct response will be recognized in the next edition.

Send solutions to
summations@uncwil.edu

Solution to spring 1999 Math Fun!

$$x + \frac{1}{x} = 5$$

Find the Value of

$$x^4 + \frac{1}{x^4}$$

SOLUTION

$$\left(x + \frac{1}{x}\right)^2 = 25$$

$$x^2 + 2 + \frac{1}{x^2} = 25$$

$$\left(x^2 + \frac{1}{x^2}\right)^2 = (23)^2$$

$$x^4 + 2 + \frac{1}{x^4} = 529$$

$$\left(x^4 + \frac{1}{x^4}\right)^2 = 527$$

Technology Upgrade Update

All 35 of the computers in the department's technology classroom, Bear Hall 161, were replaced this summer with new machines. Numerous faculty and staff members also received new office computers in the past six months. Most of the department's classrooms are now equipped with personal computers and projection systems for course instruction in an attempt to stay technologically up-to-date.



My primary field of research is coding theory. Coding theory is an area of applied mathematics that attempts to ensure accurate information transfer. My Ph.D. thesis was an abstract area of mathematics called representations of finite groups.

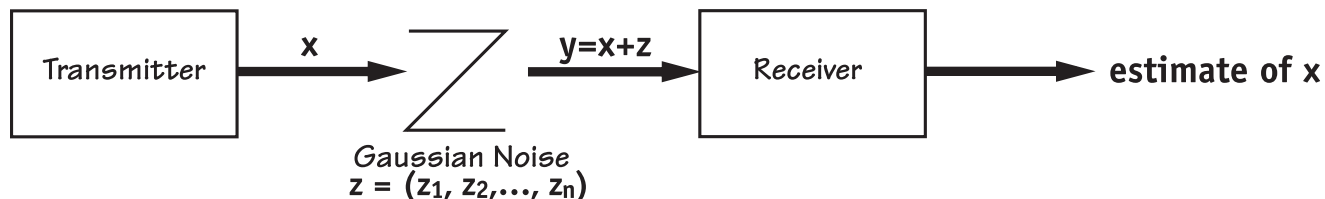
In graduate school I had little exposure to applications of mathematics. However, after I began my first job at the University of Nebraska, I discovered that although I enjoyed working on new discoveries in abstract (or pure) mathematics what really interested me was mathematical modeling and applications. Coding theory was especially appealing since it was an application of the group theory that I studied in graduate school. After a year of study, I was ready to begin producing my own results in this relatively new area of applied mathematics.

Consider a transmitter on Earth communicating with a receiver on a satellite. There is noise in Earth's atmosphere and space caused by radio signals, storms, sunspots, etc. that interferes with the message sent to the satellite. As a result, the satellite receives an altered version of the original message. The receiver must then guess the original message. The set of

signals that represents the messages available to the transmitter is called a code and the guessing procedure is called decoding. In coding theory, we use mathematical techniques to design the code and the decoding procedure so that the receiver has a high probability of guessing correctly. Coding theory is not only needed in space communication, but whenever high-speed information transfer is attempted in the presence of noise, as, for example, with computer to computer transfer over telephone lines.

My work in coding theory began with proving existence theorems. That is, showing that codes satisfying certain parameters did or did not exist. I have also developed new efficient decoding schemes and a new theory on how to generate optimal codes, those with the smallest probability of a decoding error. Currently, I am working on how to put two optimal codes together to generate a larger optimal code.

I especially enjoy working with students on mathematical research and have had the opportunity to direct twelve masters' theses while at UNCW. The results of three of these theses have been published in scholarly journals. Five theses were in the area of coding theory and the others were in my other area of research interest, operations research.



Recent Publications in Coding Theory

- **Representing Group Codes as Permutation Codes**, IEEE Transactions on Information Theory, 1999. (with E. Biglieri and E. Viterbo, Italy)
- **Decoding Spherical Codes Generated by Binary Partitions of Symmetric Pointsets**, Springer Lecture Notes in Computer Science, 1999. (with G. Liu, UNCW graduate student)
- **Optimal Permutation Codes for the Gaussian Channel**, IEEE Transactions on Information Theory, 1997. (with Y. Chang, UNCW professor)
- **Spherical Codes for the Gaussian Multiple Access Channel**, Proceedings of the 1996 International Symposium on Information Theory. (with Y. Huang, UNCW graduate student)

1999 Pi Mu Epsilon Initiates



(left to right): Andrew Moeller, Darell Matthews, Sarah Levitt, Shannon Koons, Kelly Ihne, Laurie Holland, Rosa Fuller, David Southerland, Dr. Karin Deck, Thomas Casey

The 1999 Pi Mu Epsilon initiates were: **Lisa Albert, Thomas Casey, Rosa Fuller, Laurie Holland, Kelly Ihne, Shannon Koons, Sarah Levitt, Andrew Moeller and David Sutherland.**

The UNCW chapter celebrated its 25th anniversary in 1999. **Darell Matthews** helped officiate at the ceremony. Other current students who are members of Pi Mu Epsilon are **Curtis Budd** and **Scott Watson**. **Dr. Karin Deck** is the faculty advisor for Pi Mu Epsilon.

New Graduate Assistants



(left to right): Tommy Casey, Biaozi Wei, Sarah Ives, Wenjie Wang, Francine Smith

Teaching assistants play an important role in the graduate program in mathematics. This semester, we have five new teaching assistants. These students can be seen grading papers, tutoring in the mathematics lab and, of course, taking classes. The new TAs are **Tommy Casey, Sarah Ives, Francine Smith, Wenjie Wang, and Biaozi Wei.**

Tommy Casey graduated from UNCW last spring with a major in mathematics. He is a native of Currituck. He is a big sports fan and took a large number of physical education courses as an undergraduate student.

Sarah Ives is from Grand Rapids, Mich. She did her undergraduate work at the College of Wooster. During her undergraduate work she completed an independent study project on fractals, especially the Julia Sets.

Francine Smith is from Monessen, Pennsylvania. She received a B.S. in industrial engineering from Penn State. Francine interrupted her studies two years ago when she and her U.S. Army husband moved to Hawaii. While there, she taught college math for Hawaii Pacific University to soldiers enrolled in the Soldier Leadership Development Program. Now she is back to finish her master's degree.

“The best part about being a TA is working with students in the math lab and review sessions.”

Sarah Ives

Wenjie Wang is from Wuhan, the largest central city in the Peoples Republic of China. He did his undergraduate work in Wuhan at Huazhong Science and Technology University where he earned a degree in Chemical Engineering. He then worked four years as a chemical engineer in Wuhan. We are delighted that he was able to get a visa in spite of many obstacles and that he was able to start his graduate work this fall.

Biaozi Wei is from the Hunan Province, Peoples Republic of China. He did his undergraduate work at Shanghai Jiao Tong University. He has had several years of experience in the research of Material Engineering in China. During that time, he was often puzzled by some theoretical problems; thus, he decided to do further study and research.

News Briefs

- **Russ Herman** was named faculty member of the year for 1998-1999 at the Greek Award of Excellence Program in April. With this award the Greek community recognized “dedication and commitment to the entire UNCW student body.” Other nominees were **M. Bradley** of Psychology and **L. Buttino** of communication studies. Excerpts from the nomination letter read: “Not only does he dedicate time and abilities to his students, but he does this effortlessly without any hesitation...He truly cares about the students’ education and their well being... He proves to be and still exemplifies what an outstanding faculty member is...”
- **Wenlan Lu** and **Zhicheng Hu** of Raleigh are continuing to support the International Graduate Student Fund.
- Congratulations to **Sandy Carlson** and **Philip Gildea** who were married October 9. Sandy is the Math Lab director at UNCW and Phil works at Corning as a controls and software engineer.

Alumni News

- **Steve Felzer '94** is currently working on his Ph.D at North Carolina State University. Prior to his return to school he taught at Lenoir Community College in Kinston.
- **Richard Scott Haynes '93** graduated with a B.S. in computer science and a B.A. in mathematics. Scott is currently employed as a senior software engineer with Virtus Corporation in Cary, NC.
- **Shajuana Humphrey '99** is currently teaching mathematics at Clinton High school in Clinton.
- **Craig Kornegay '99** is currently an algebra teacher at Clayton High School.
- **Karissa Kramer '96** is working at IBM.
- **Darell Matthews '99** is currently teaching mathematics at Clinton High School in Clinton.
- **Greg Plow '99** is teaching mathematics at Cardinal Gibbons High School in Raleigh, North Carolina.
- **Sara White '97** received her M.A. in Mathematics Education at UNCC and is currently teaching at Vance High School in Charlotte.

Welcome Professors

Welcome to our visiting professors.

- **Jean-Claude Evard Ph.D.**, Ecole Polytechnique Federale de Lausanne, 1985. Dr. Evard’s main research interest is in operator-valued functions defined on manifolds and applications to differential equations involving such functions.
- **Michael Freeze Ph.D.**, University of North Carolina at Chapel Hill, 1999. Dr. Freeze’s research has been on theory and associated invariants of Dedekind domains, including the strong and weak Davenport constants.

We want to hear from you!

Please provide us with information about yourself. Where are you and what are you doing? Do you know of other alumni? If so, please include information about them as well.

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