

AfterMath

The Newsletter of the Department of Mathematics at Marshall University

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Fall 2008

From the Chair

by Bonita Lawrence

During the fall semester, with our Chairman, Ralph Oberste-Vorth, on sabbatical leave, I stepped in and took the helm of Department and kept it on a steady course. It was an interesting experience and it offered me a new perspective on what it takes to keep the Department running smoothly. My hat is off to Ralph for the work he does in this position as well as to Evelyn Pupplo-Cody (Associate Chair) and Stacy Good (Department Secretary) who helped me keep things running well during his absence.

We have two new bright young assistant professors joining us this semester in tenure-track positions. They are talented and creative both in the classroom and in their research endeavors. David Hyeon comes to us from Northern Illinois University. He has a thriving research program in the field of algebraic geometry. Anna Mummert has expanded her research in dynamical systems to include modeling physical systems. One of her current collaborative projects, with Charles Somerville (Biology) and me, is a study of antibiotic resistant bacteria in the Ohio River. We are very pleased to have these wonderful additions to our mathematics family.

In December, the University held its first Fall Convocation. The event took place in the Keith-Albee Theatre, our lovely vaudeville-era showplace located downtown on 4th Avenue. As a volunteer at the Theatre, my heart was gladdened by the joy and happiness that filled the place as our students celebrated with their families and professors this important step through the threshold that leads to a life of the mind and a professional career. It was a wonderful celebration with a firm connection to the past and unbridled hope for the future.

I appreciated the opportunity to be Acting Chair for a semester and was very happy to hand the reins back to Ralph in January!

Faculty Profile: Alfred Akinsete

Alfred Akinsete joined the Department of Mathematics in the fall of 2003 as an associate professor. Alfred has recently been promoted to full professor. In the following interview he discusses how he came to be part of the faculty at Marshall University.

Q. Tell us a bit about the journey that brought you to Marshall.

A. *I am an alumnus of the University of Ibadan, Nigeria, where I had obtained the Bachelor of Science, Masters of Science and Doctor of Philosophy degrees in the Department of Statistics although a segment of my Ph.D. work was carried out at The University of Sheffield, England.*

In 2000, I left my position in the Department of Mathematical Sciences at the University of Agriculture, Abeokuta, Nigeria (UNAAB), for South Africa, where I accepted a position in the Department of Statistics at the University of Transkei, now Walter Sisulu University. I had taught at UNAAB for 17 years, and was Chair of the department for seven of the years and headed two other Centers of the university. I left South Africa in 2002 for a one-year temporary position of Associate Professor in the Department of Statistics at Saint Cloud University, Saint Cloud, Minnesota. It was from Saint Cloud State that I joined Marshall in 2003 as associate professor in the Department of Mathematics.



Q. What has favorably impressed you about Marshall?

A. *Basically, Marshall is not too different from any other institutions of higher learning where I had worked, in terms of their missions, visions and mandates, as they relate to teaching, research and service. Marshall offered*

me the opportunity to be actively engaged in the three areas. I also like living in a small city, and the Tri-state area is a wonderful place to live and raise children.

Q. What research are you currently working on?

A. *I am currently interested in distribution theory, queuing networks, and statistical modeling of stable marriage.*

Q. Why were you attracted to mathematics in general, and probability theory in particular?

A. *My interest in mathematics is dated back to my days in high school. I had intended to read mechanical engineering after high school. However, my letter of admission arrived rather late, and I had to accept the offer to pursue a degree in computer science. The year after, witnessed the exodus of many computer science professors to greener pastures in the computing firms. With the dearth of manpower, and since I had intended to study a mathematically related course, I opted to pursue a degree in statistics after the freshmen year. The understanding was that, statistics makes you a mathematician, but the reverse is not generally true. And to my interest in probability, I guess it offered me the mathematical rigors in statistics.*

Q. What research have you done with students?

A. *I started my career where it was mandatory that every faculty be actively involved in undergraduate re-*

search advising. As a result, I had supervised a numerous number of undergraduate and graduate students. At Marshall, I have supervised three graduate theses in the last three years. And in particular, I have involved an undergraduate student in my research. Results of our joint work were presented at the annual Joint Meeting of the American Statistical Association in the summer of 2007 and 2008, at Salt Lake City, Utah and Denver, Colorado respectively. Publications of the two research findings appeared in the Proceedings of the Association.

Q. What outreach activities have you been involved in?

A. As a statistician, I am continually involved in consulting with colleagues and individuals from outside of the university. In particular, I am involved in two state grants as an expert in mathematics, working with some middle and high school teachers in some counties of West Virginia, incorporating the use of technology in the teaching of mathematics and statistics. The projects meet at various times in the semesters and one or two weeks in summer.

Q. What awards have you received for your work in mathematics or statistics?

A. I am a Chartered Statistician (CStat), and a Fellow, both of the Royal Statistical Society of England.

Q. Could you talk a bit about your work in the statistics of soccer?

A. I have been engaged in the statistical analysis of soccer data for a while, but let me highlight one of my works with an undergraduate student as a summary. Essentially, the work considered the statistical analysis of soccer data of series of games played between 1995/96 and 2005/06 league seasons by teams in the English Premier League. It investigated the home field advantage of teams playing on home grounds against the performance of visiting teams. The winning, losing and drawing probabilities of teams were calculated using a winning probability model proposed in a previous work by me. The stochastic behavior of teams, as they transitioned weekly from one position or state to another, within the state space {win, draw, loss} was investigated. The steady state probabilities of the stochastic matrices arising from various transitions were calculated. The work also investigated the Clarke and Norman's model, as a measure of team ranking in the league. Finally, the randomness in the performance pattern of the teams was also investigated, using the runs test.

Q. What do you do when you are not doing mathematics?

A. Hmm, it is difficult to say when a mathematician's mind is completely tuned off from thinking mathematically. Howbeit, I love to read Christian literature, travel, and I dance.

Q. Who is your favorite mathematician or statistician, and why?

A. Carl Friedrich Gauss (1777–1855), concerning his work on the Central Limit Theorem, among many others, and who after proving a theorem, would oftentimes said that the insight did not come from any “dint of painful effort but, so to speak, by the grace of God.” And according to Kronecker, “almost everything which the mathematics

of our century has brought forth in the way of original scientific ideas attaches to the name of Gauss.”

Q. How would you like people to describe you?

A. A good father, a very loving husband, and a dedicated teacher.

Q. What is your favorite quote?

“Finally Brethren, whatsoever things are true, whatsoever things are honest, whatsoever things are just, whatsoever things are pure, whatsoever things are lovely, whatsoever things are of good report, if there be any virtue, and if there be any praise, think on these things.”

PME Activities

Marshall University's chapter of Pi Mu Epsilon accomplished much during the fall and prepared for the upcoming semesters. As in previous years, the members of the club with their advisor, **Shannon Miller**, and fellow instructor, **Rob-Roy Mace**, attended the Ohio Section MAA conference. This fall's October meeting was held at Capitol University in Columbus, Ohio. Two of the student attendants gave 20-minute talks. **Tom Cuchta**, currently an undergraduate in the mathematics department, gave a presentation on his independent summer research in abstract algebra, specifically zero divisors, which has recently been published. **Michael Otunuga**, a graduate student, gave a talk about his research on the Riemann Hypothesis. Also attending were **Deepak Basyal**, **Sydney Mkhathshwa**, **Brittany Balcom**, **Charlie Lowe**, **Danielle Clark**, and **Clyde Meador**. The PME group was able to recruit 11 new members for the Fall 2008 semester. The new members are, from left to right, (first row) **Amy Seitz**, **Lisa Mathis**, (second row) **Grace Amusan**, **Sam Skelley**, **Brittany Whited**, **Maggie Chenoweth**, **Sydney Mkhathshwa**, and **Alex King**.



Mike Smith, **Deepak Basyal**, and **Carla Ramirez** are not pictured. PME is working on a "FUN-raising" pumpkin drop competition in conjunction with the Physics Department. The task will be to create a protective vessel to contain a pumpkin that will be dropped from a rooftop which will keep the pumpkin from shattering. The group also has goals of table tennis tournaments and other game parties

for next semester. Pi Mu Epsilon welcomes all to our meetings for fun, food, and math!

Alumni Profile: Craig and Kim Wood

Craig and Kim met in Dr. Aluthge's Advanced Calculus class in the fall of 1994. Craig graduated with his undergraduate degree in the summer of 1995 and Kim graduated with her undergraduate degree in the fall of 1995 followed by her graduate degree in the spring of 1997. They were married in 1996 and were so happy that Dr. Aluthge was able to attend the wedding. They have three children: Austin – 10, Ethan – 6, and Brooke – 4.

Craig was hired immediately after graduation by Stagg Resource Consultants, a consulting firm to the natural resource industry located in Cross Lanes, West Virginia. He worked his way up through the firm and is currently Vice President and Chief Financial Officer as well as his consulting role as Senior Economic Analyst. His consulting work has included projects involving zinc, copper, gold, silver, lead, coal, oil, natural gas, phosphate, potash, salt, crushed stone, or sand and gravel properties and/or operations located in almost every state in the U.S., as well as Canada, Eritrea, and China. Kim taught at Ripley High School for one year and then started working with Dr. Matt Carlton at American Benefit Corporation in Huntington. She currently serves as the Director of Actuarial, Accounting and Trust Operations. She is taking the actuarial exams, would ultimately like to work as an actuary, and hopes to be an Enrolled Actuary by spring 2009. She has also enjoyed being able to return to Marshall University and the Math Department and teach a few of her own classes. Between the kids and her career she has not had enough time to do this lately, but hopes to again in the future. Craig is an associate member of the American Institute of Minerals Appraisers and expects to have his certification in 2009. He has taken numerous specialized short courses to further both his career and education, participated as a workshop instructor for the preparation of discounted cash flow models, and presented a paper during the 2006 annual meeting of the Society of Mining, Metallurgy, and Exploration in St. Louis.

When asked how mathematics has helped shape their careers, Kim responded that, "Mathematics is my career. I started my career in math education in hopes of being able to communicate my understanding and love of the subject to other people. Ultimately, mathematics and my education at Marshall led me to a career where I can positively impact the lives of many people, by working for health and pension plans. This work involves using mathematics to calculate the value of retirement and health benefits and the resulting liabilities of the plans. We perform many studies involving projections and forecasting based on both experience and trends. I often have the privilege of presenting our actuarial reports, and am also involved with the consulting side of American Benefit Corporation. I believe I am fortunate enough to have found a career that allows me to blend both my mathematics and educational training."

Craig said, "There is not a day at work where I do not use math in some form or fashion. In my position as CFO I oversee the firm's accounting, corporate administration, human resource, and information technology operations, so at a minimum I deal with the financial situation of the company. However, in my consulting role as Senior Economic Analyst, I am involved in a wide variety of economic feasibility and market studies, mineral appraisals, and litigation support. In this capacity, my responsibilities include project management; executing appraisal assignments; performing property inspections; developing complex and highly detailed costing, pricing, tax, and discounted cash flow models; analyzing historic performance data of companies ranging from small mining operations to multi-billion dollar entities; developing forecasts of performance, pricing, and discount rates; report preparation; and critiquing opposing expert work. Much of this work involves spreadsheet modeling with formulas incorporating multiple variables and parameters along with the ability to visualize both the "big picture" and the analysis of the little details. I believe the diverse math education that I received at Marshall—ranging from applied classes such as linear algebra to more theoretical classes such as topology and advanced calculus—helped to prepare me for the different aspects of this career."

Both Craig and Kim enjoy going to the movies, shopping for antiques, and spending time with their children.

Faculty News

Alfred Akinsete had a busy 2008. He was granted tenure and was promoted to full professor. He presented at the following conferences: the 7th World Congress in Probability and Statistics, Singapore; July 14-19, 2008; Joint Statistical Meeting of the American Statistical Association, Denver, Colorado; August 3-7, 2008; Royal Statistical Society Conference, Nottingham England; September 1-5, 2008; and also attended the Recreational Mathematics Conference, Miami University, Oxford Ohio on September 26-27, 2008, with three graduate students. He became Fellow of the Royal Statistical Society, England, was awarded Chattered Statistician (CStat) of the Royal Statistical Society, and had an article, *The beta-Rayleigh Distribution and Reliability Measure*, accepted for publication in the Proceedings of the American Statistical Association.

David Cusick attended the Fall Meeting of the Ohio Section of the Mathematical Association of America, which was held on Oct. 24 & 25 on the campus of Central University in Columbus, Ohio. He organized and ran the Mathematics Department Teaching Seminar, which met four times during the semester. He was Faculty Marshal for the College of Science during the first-ever Fall Graduation Ceremonies on Dec. 6.

Yulia Dementieva had two papers accepted for publication: *Obesity is not a risk factor for gastroesophageal reflux disease in symptomatic children: a retrospective analysis from 738 West Virginian children*, Y. Elitsur, Y. Dementieva, R. Elitsur, M. Rewalt to appear in *Metabolic Syndrome and Related Disorders*, and *Helicobacter pylori*

infection rate in symptomatic children: a retrospective analysis of 13 years (1993 - 2005) from a gastroenterology clinic in West Virginia, Y. Elitsur, Y. Dementieva, M. Re-walt, Z. Lawrence to appear in the Journal of Clinical Gastroenterology.

We are pleased to welcome **David Hyeon**, **Anna Mummert**, and **Carl Mummert** to the faculty. David received his Ph.D. from the University of Illinois in 2001. His research area is algebraic geometry. He comes to us from Northern Illinois University after holding a post-doctoral position at Rice University. Anna received her Ph.D. from Penn State University in 2006. Her research area is dynamical systems. She comes to us after visiting positions at Alfred and Michigan State Universities. Carl received his Ph.D. from Penn State University in 2005. His research area is mathematical logic. He will be on leave during the academic year 2008-09 while completing a postdoctoral position at the University of Michigan.

Student Seminars

The Department of Mathematics and Pi Mu Epsilon hosted student seminars this fall. Everyone met for refreshments and mathematics once each month.

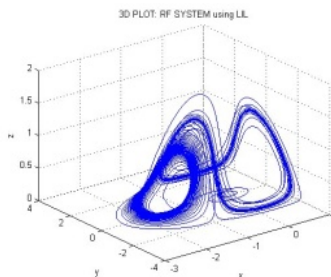
Tom Cuchta, currently an undergraduate in the mathematics department, presented in September. He talked about his summer research in Group and Ring Theory and the maps for such rings. His research has re-



cently been published.

Michael Otunuga, a graduate student, presented his research in October. He discussed his work on the Riemann Hypothesis and Fermat's Last Theorem.

Clyde Meador, an undergraduate, gave his presentation in November on his current thesis topic involving numerical differential equations. Clyde has also created extraordinary computer programs that plot chaotic attractors for his systems.



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