



SUMSRI Newsletter



Front row: Brittany DiPietro, Virginia Ahalt, Dusti Nisbet, Ramone Gordon, Nicole Cleary, Lauren Vollmer, Bonita Porter, Margaret Rahmoeller, Anna Tracy, Beihua Yan, Dr. Legette. Back Row: James Weigandt, Koffi Gerard, Alexander Hill, Mychael Sanchez, Joshua Edgerton, Ashley Swandby, Daniel Caproni, Dr. Dowling, Dr. Farmer, Cory Washington, Dr. Akhtar, Dr. Waikar.

SUMSRI 2009

On Saturday, May 30, fifteen new SUMSRI participants arrived, from all across the nation, to do mathematical and statistical research for the next seven weeks at Miami University in Oxford, OH. They met new roommates and GA's and unpacked luggage. This was move in day, but classes started bright and early on Monday.

The course schedule was full and fast paced. Real analysis class, research seminar, lunch, research seminar and mathematical writing class all fly by and notebooks fill with notes. Dinner. Then homework. Discussions to share information about what's

been presented, searches for more information concerning the research topic, and wondering how they could make it, and why it's so much fun!

Amidst colloquium speakers, classes in GRE Prep and Advanced Algebra class, research groups met to discover new results in Number Theory, Multivariate Statistics and Discrete Mathematics.

SUMSRI 2009 welcomed back **Dr. Lakeshia Legette**, professor of Mathematics at Johnson C. Smith University in North Carolina. As Visiting Research Director, Dr. Legette led five under-

graduates to research the ABC conjecture. Some readers may recognize Dr. Legette from SUMSRI 2004 & 2005 when she assisted Dr. Goins in the Number Theory group.

SUMSRI also welcomed back **James Weigandt** (SUMSRI 2007) as a GA for the Number Theory group and **Ashley Swandby** (SUMSRI 2007) as GA for the Multivariate Statistics group.

Dr. Jennifer (Everson) Davis (SUMSRI 2001) returned to SUMSRI as a colloquium speaker to share her research in cryptography.

Inside this issue:

SUMSRI 2009	1
2009 Research Projects	2
Changes	3
Where Are They Now	4-6

Help Us Recruit the next SUMSRI participants!

Do you have promising students or classmates who are thinking about the possibility of going to graduate school? Do you think they could benefit from the intensive summer work at SUMSRI?

Send them to:

<http://www.units.muohio.edu/sumsri/>
Or call 513-529-8118

Discrete Mathematics—Dr. Reza Akhtar

Daniel Caproni, Joshua Edgerton, Margaret Rahmoeller, Mychael Sanchez, and Anna Tracy spent their summer researching the **Linear Chromatic Numbers of a Graph**. Led by Dr. Reza Akhtar and graduate assistant, Cory Washington, these participants did research into linear colorings and the linear chromatic number of graphs. They described a strategy used to find linear colorings of graphs and computed the linear chromatic number for specific graphs. They briefly discussed linear N -graphs in their final paper and then found bounds on the linear chromatic number of graphs.



Left to Right: Dr. Akhtar, Joshua Edgerton, Cory Washington (GA), Anna Tracy, Daniel Caproni, Margaret Rahmoeller, and Mychael Sanchez.

Number Theory—Dr. Lakeshia Legette



Left to Right: James Weigandt, Koffi Gerard, Alexander Hill, Beihua Yan, Dr. Legette, Nicole Cleary, and Brittany DiPietro

Nicole Cleary, Brittany DiPietro, Alexander Hill, Gerard D. Koffi, Beihua Yan came together to research **ABC Triples via Elliptic Curves**. Five participants studied the connection between elliptic curves and ABC triples. Two important results were proven. The first provided a method for finding new ABC triples. The second result stated conditions under which the power of the new ABC triple increases or decreases. Finally, they presented two algorithms stemming from these two results. The group was led by Dr. Lakeshia Legette (former SUMSRI GA) with the help of James Weigandt, graduate assistant.

Multivariate Statistics—Dr. Vasant Waikar

Where is the Third World? That is the question tackled by the statistics group led by Dr. Vasant Waikar, assisted by Ashley Swandby (GA). Virginia Ahalt, Ramone Gordon, Dusti Nisbet, and Lauren Vollmer analyzed a set of 13 variables on a sample of 170 countries. After normalizing the data, they performed Principal Component Analysis and Factor Analysis to reveal its themes and underlying factors. They then classified each of the 170 countries as developed, developing, or underdeveloped based on two Discriminant Analyses. The first discrimination rule used a published list of the current world divisions and the second discrimination rule relied on divisions based on the first principal component they generated in their Principal Component Analysis. They compared the two analyses and concluded that their classification system more accurately described the current state of world development.



Left to Right: Virginia Ahalt, Ashley Swandby (GA), Ramone Gordon, Dusti Nisbet, Lauren Vollmer, and Dr. Waikar

Faces of Change



Dennis Davenport and Vasant Waikar

Changes are in the works! Dr. Dennis Davenport, the man who envisioned SUMSRI and worked so hard to bring it into being, has accepted a job at the National Science Foundation. As an NSF employee, he cannot be directly involved as a Primary Investigator (PI) for any program receiving funding from the NSF. In the first years of SUMSRI, Dr.

Davenport recruited students and selected participants, led a research group, taught the algebra short course and so much more. Anything that was needed, he did it. Dr. Davenport created the structure of SUMSRI including the advanced math short courses, mathematical writing and GRE preparation courses.

Dr. Waikar, who has been involved with the SUMSRI program since its inception, will be retiring from Miami University in December 2009. He participated both by being the research director for the statistics group for eleven years, but also as co-PI for nine years. Many SUMSRI participants will also remember the delicious dinners prepared by his wife, Sarla Waikar, and the generous hospitality she extended to all at their home. Both men have been central to the development and continuity of SUMSRI. They've been responsible for

getting out the word that programs like SUMSRI are successful at preparing students for the rigors, research and writing required in graduate mathematics and statistics programs across the country. The success of everyone on the following pages are partially due to their efforts.

In 2010, Drs. Reza Akhtar and Patrick Dowling will step in as SUMSRI co-Directors. Past SUMSRI participants will recognize Dr. Dowling as the instructor for the real analysis short course and Dr. Akhtar as either the Algebra Short Course instructor or the research director for the algebra/discrete math research group.



Patrick Dowling and Reza Akhtar

Other Changes

The Department of Mathematics and Statistics has hosted SUMSRI for the past eleven years. This year the department split in two creating the Department of Mathematics and a separate Department of Statistics. It was decided that SUMSRI would be housed in the Department of Mathematics, although it will continue to work with the Department of Statistics faculty to maintain and improve SUMSRI programming.

SUMSRI Statisticians Unite at Joint Statistics Meetings

The Joint Statistics Meetings witnessed an informal reunion of former SUMSRI participants. Pictured to the right are **Anthony Franklin** ('06), **Christina MacIntosh** ('07) and **Takisha Harrison** ('08) with **Dr. Waikar**. These students now attend graduate programs in statistics or biostatistics at North Carolina State, Harvard and Iowa State Universities respectively. Each student was an active part of the JSM program whether presenting their SUMSRI research or their university in some way.

Thanks to Luvenia Hellams (graduate student at Iowa State University and former Spelmanite) for this photo.



Where are they now?

1999

Kathleen (Bellino) Hickey—DOD, underwater sonic research.

Joy Coleman—teaching high school math and proprietor of a tutoring service.

Rebekkah Dann, DrPH—designs drug trials for GlaxoSmithKline, engaged to be married in October 2009.

Melissa Desjarlais, PhD—asst. professor, Valparaiso University, her dissertation topic was "Gender Differences on the American Mathematics Competition AMC 8 Contest".

Lynn Holmes, MPH—Math Instructor, Central Piedmont Community College.

Duke Hutchings, PhD—asst professor, Elon University.

Bethany (Lyles) Goldblum, PhD—enjoying being a first time mom.

Megan (Ruhnke) Mistichelli—US Census Bureau and happy newlywed.

Michael Stovell—No specific updates.

James Williams—no specific updates.

We would like to hear from: **Laurie Davis, Sandrina Gould, Margaret Hall, and Rachel Kahlenberg.**

2000

Danielle Boyd—teaching high school math in Maryland, back from recent trip to India.

Betsy LaPlant—statistician, Mayo Clinic.

Brandon McKenzie—Sr. Actuarial Assistant at Golden Rule Insurance Company.

Bethany (McLemore) Loeffler—new mother of three!

Candace Porter—biostatistician, researching Alzheimer's Disease.

Michael Sotelo—co-inventor of new type of antenna developed by a team

from Raytheon.

Dana (Thompson) Allen—teaching Junior High math.

Victoria (Wood) Pace, PhD—Assistant Professor, Industrial/Organizational Psychology, Florida International University.

We would like to hear from: **Lawrence Garcia, Jennifer Hebert, Lindsay Kellam, and Huan Song.**

2001

Khalilah Beal—math graduate student at UC-Berkeley.

Sarah (Breede) Culp—operations analyst at Allconnect.

Sarah (Burke) Buzzell—on facebook. Now living in VA. No response.

Ledah (Casburn) Rutledge—software consultant, PTV America.

Jennifer (Everson) Davis, PhD—colloquium speaker at SUMSRI this summer. Working at Rockwell Collins.

Christy (Finch) Gautre—Sr. Geophysical Technician, Shell Oil.

Melissa Hildt—teaching high school algebra II and trigonometry.

Lisa (McGee) Bey—data analyst, Progressive Insurance. With recent move to South Carolina, looking for job in similar field.

Tuyet-Linh Phan—teaching high school math in California.

Christian Roldan Santos—Black Hawk College Math Instructor.

We would like to hear from: **Robert Davis, Jillian Martens, Jason Popovic, Lisa Sparrgrove, and Sarah Zimmermann.**

2002

Kelly Anderson—Asst Prof, College of the Mainland.

Megan (Breit) Goodwin—Math



Dr. Waikar and Emilola Abayomi (SUMSRI '06) at the 50th Anniversary of Florida State University's Statistics Department

Instructor, Anoka Ramsey Community College, recovering from foot surgery.

Leigh Cobbs, PhD—completed her PhD in July on "Lattice Subgroups of Kac-Moody Groups". Now teaching at Lebanon Valley College in Pennsylvania.

Mary (Cunningham) Comeau—Biostatistician, Wake Forest University.

Didier Deshommes—software engineer, Intelligent Information Systems.

Andrea Falden—Program Officer, Winston-Salem Foundation.

David Friedenberg—Statistics Instructor, Carnegie Mellon University.

Cheryl Gerde—Franchise Training Director at an international training franchise in Colorado.

Shenek Heyward—being a mom for the moment.

Stacy Hoehn—new PhD! Doing a NSF sponsored Post-Doc at Vanderbilt University.

Lateefah Id-Deen—teaching high school math and searching for a PhD program.

Laura Lynch—teaching and studying at Univ. of Nebraska, Lincoln.

Catherine (Nightingale) Schmurr—teaching math at Linn Benton Community College.

Monique (Richardson) Taylor—Math Dept., North Carolina State University, awarded Certificate of Accomplishment in Teaching.

We would like to hear from: **Leslie Calloway, Jacquis Casher, and Mary Ann Coleman.**

2003

Kelli Hall—grad student in math, University of Nebraska at Lincoln.

Lori Hoffman—grad student in statistics, The Ohio State University.

Maria Joseph—grad student in statistics at Iowa State University.

April Kerby, PhD—asst. professor in statistics, Winona State University.

James Lawrence—US Census Bureau.

Alicia Richardson—completed masters in math at Howard University. Soon to complete certification in computer security.

Nancy Rodriguez—graduate student in mathematics at UCLA.

Natalie Scala—graduate student in industrial engineering, University of Pittsburgh.

Andrea Watkins—graduate student in mathematics, Duke University.

We would like to hear from **Lisa Bush, Sarah (Horton) Gaudet, and Maya Johnson.**

2004

Sara Blight—graduate student in mathematics, Rutgers University.

Jarrod Cunningham—musician!

Ralph Gedeon—teaching math in south Florida.

Nancy Ho—graduate student in math, University of Oklahoma.

Nick Imholte—graduate student in math, University of Nebraska, Lincoln.

Karen Lostritto—graduate student in bioinformatics at Yale University.

Jon Middleton—graduate student in mathematics at University of California,

San Diego.

Amanda (Phillips) Kinzel—graduate student in mathematics at Purdue University.

Julie Rogers—graduate student in math at Auburn University.

Kevin Tolliver—working at the US Census Bureau and on writing his dissertation.



SUMSRI really helped me in making the decision between being a math or computer science major (math won). And I'll be applying for grad school in the fall.

—Megan Bernstein,
SUMSRI 2008

Kendall Williams—graduate student in math at Howard University.

Frances Worek—graduate student in math, University of Maryland.

We would like to hear from **Nikia Thomas.**

2005

Kathleen Ansaldi, math graduate student, University of Nebraska, Lincoln.

Camil Aponte Roman, math graduate student, University of Washington—just one more comprehensive exam!

Natalia Cordova Sanchez—completed Masters in applied math. Currently working as a Research Assistant in the neuroscience lab, Princeton University.

Adrianne Demski—graduate student in statistics, University of Pittsburgh.

Allison Ford—artist!

Jennifer George—math graduate student at The Ohio State University.

Clyde Gholston—masters degree. Now teaching high school math in Virginia.

Helen Hauser—graduate student in German at The Ohio State University.

Janelle Jones—Peace Corps, Small Business Development work.

Nathan Mims—teaching high school math and coaching football.

Kevin Mugo—graduate student in math at Purdue University.

Joshua Svenson—lecturer in statistics, The Ohio State University.

Patrice Johnson, Monique Owens and Charles Phifer are all on Facebook but had no specific updates.

2006

Emilola Abayomi—Statistics graduate student, Florida State University.

Chantelle Bicket—math graduate student, University of Nebraska, Lincoln.

Ashley Brooks—math graduate student, University of North Carolina, Charlotte.

Terris Brooks—working as a financial advisor in a loan company.

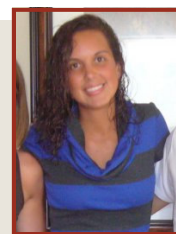
Erin (Esp) Dienes—finished master's in biostatistics at University of California, Davis. Will be taking qualifying exams this fall for the PhD program.

Elizabeth Fowler—completed master's in math in June '09. Is now teaching high school math in Tennessee.

Anthony Franklin—statistics graduate student, North Carolina State University. Passed the first

I learned many different strategies for solving difficult problems. SUMSRI definitely opened my eyes to all the possible career paths I could choose, but I have decided to continue the path of getting my FSA and working in the corporate world after graduation. I think that graduate school is always an option but feel at this point, getting experience in the industry and finishing my exams are the most important things. This program was definitely an encouragement for my future and met some people I will remember forever.

—Holly Sontag, SUMSRI 2008



PhD qualifying exam.

Samantha Graffeo—graduate student, University of Colorado, Denver.

Shannon Grant—finished master's in biostatistics, University of Washington, Seattle.

Katherine Hastings—math graduate student at Clemson University. One more preliminary exam to go. Starting PhD in operations research.

Danielle Hiance—social work graduate student at The Ohio State University. Did you know social workers needed to use ODE's?

Whitney Ross—has applied to grad schools in actuarial science for Spring semester.

Amber Shoecraft—The Ohio State University.

Edward Washington—math graduate student at North Carolina A&T.

Matthew Zimmerman—on Facebook but no specific updates.

2007

Andrea Austin—statistics graduate student, Brown University.

Katherine Benson—math graduate student, University of Iowa.

Louis Cruz—working at University of Puerto Rico.

Yesenia Cruz Rosado—in Germany with military husband, seeking educational opportunities there.

Terrell Felder—structural engineer, Sargent & Lundy.

Jessica Flores—newlywed!

Kimberly Jones—math education graduate student at Georgia State University.

Christina McIntosh—statistics graduate student, Harvard University.

Lindsay Moomaw—industrial engineering grad student, North Carolina State University.

Anne Rollick—volunteering in Germany.

Alicia Smith—graduate student, applied mathematics, North Carolina A&T University.

Ashley Swandby—teaching assistant in the Statistics research group during SUMSRI '09. Statistics grad student at North Carolina State University.

Melissa Tolley—math graduate student, North Carolina State University.

Bryant Watkins—senior at University of Maryland, Baltimore County. Also working part time for AMSAA at the Aberdeen Proving Ground.

James Weigandt—teaching assistant in the number theory research group, SUMSRI '09. math graduate student at Purdue University.

2008

Megan Bernstein—senior at University of California, Berkeley.

Megan Boggess—senior at Columbia Union College.

Angela Buck—grad student in applied statistics /operations research at Bowling Green State University.

Takisha Harrison—statistics graduate student, Iowa State University.

Samuel Ivy—math graduate student at North Carolina State University. Attended the RIPS REU at UCLA this past summer.

Tiffany Jackson-Henderson—senior at St. Augustine's. worked at Camp Tecumseh during the summer.

Brett Jefferson, math graduate student, Indiana University.

Isidora Jimenez—just returned from France, by way of north Africa!

Linden Johnson—opened his own business while waiting to start graduate school in January at Georgia State.

Michele Josey—statistics graduate



Everything was different after I got back from SUMSRI. I was a lot more interested in the theory behind math/stats and wanted to challenge myself more. SUMSRI made me real-

ize that I definitely want to go to graduate school. Before, I was planning on being a high school teacher, but the colloquiums at SUMSRI helped me realize all of the different options I had available that I never knew about. It made me really excited for graduate school and the chance to continue to learn more and do more research. SUMSRI also made a big difference in me outside of the classroom. I try to spend a lot more time now meeting new people and learning about where they come from, because spending 7 weeks with people from all over the country made me realize how different we all are, and it's fascinating!

Stacy White, 2008

student at The Ohio State University.

Rachel Karpman—senior at Claremont College.

Cheryl Outing—junior at Spelman College.

Holly Sontag—senior at Butler University, recently finished internship in insurance industry.

Cliff Taylor—senior at Grand Valley State University.

Staci White—senior at Shawnee State University.

Thanks to everyone who sent information to help update this section. I hope you can use the information to network to find your way through the career maze of mathematics and statistics.