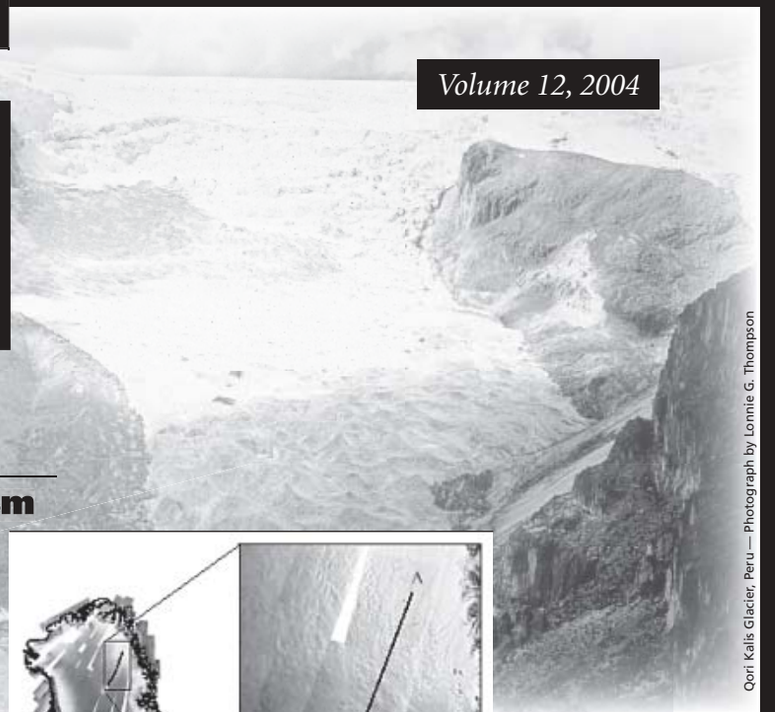
THE OHIO STATE UNIVERSITY

DEPARTMENT of STATISTICS
NEWS

Volume 12, 2004



Qori Kalis Glacier, Peru — Photograph by Lonnie G. Thompson



## Understanding the Flow Mechanism in Ice Streams and Glaciers

Professors Mark Berliner and Noel Cressie are involved in a collaborative research effort with Professors Ken Jezek and Kees van der Veen from Ohio State's Byrd Polar Research Center and the Department of Geological Sciences. Three RAs from Statistics, Eric Lam, Yongku Kim, and Rajib Paul, are also participating in the project. The research is funded by the National Science Foundation, with funds coming jointly from the Office of Polar Programs and the Probability and Statistics Program. The title of the grant is "Dynamics of Ice Streams: A Physical Statistical Approach."

Ice streams are believed to play a major role in determining the response of their parent ice sheet to climate change and in determining global sea level by serving as regulators on the fresh water stored in the ice. Understanding the relative forces controlling the flow of ice streams is essential for developing models for future evolution of polar ice systems. In this project, the researchers are applying "physical statistical" models, developed via a Bayesian hierarchical strategy. The central idea of physical statistical modeling is to develop statistical models that rely strongly on physical reasoning regarding the phenomena of interest. Glaciologists have developed models from applications of physics regarding ice stream flow. Also, relevant datasets have recently become available. These include remotely-sensed observations of ice thickness, the topography of ice-stream and glacier surfaces, and velocities of surface flow.

Two fundamental problems motivate our approach. First, both physical models and observations provide important information but are both subject to uncertainty.

*(continued on page 10)*

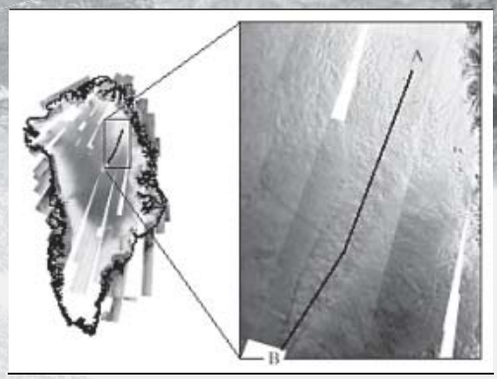
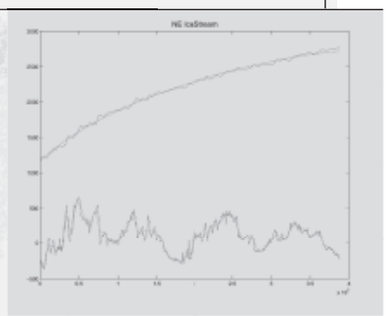



Figure shows Greenland with a region of the North-East Ice Stream broken out. The line shown indicates the study region consisting of a transect covering about 400 kilometers over which our data was collected as part of the program for Arctic Climate Assessments.



Plots of surface observations and base observations along with fitted models along a profile of the NE Ice Steam in Greenland. All quantities are in meters.

## CONTENTS


- Understanding the Flow Mechanism in Ice Streams and Glaciers
- Bayesian Analysis of Response Time Data
- A Letter from the Chair
- MBI Year to Focus on Genomics, Proteomics, and Bioinformatics
- Efforts to Increase Student Confidence
- Statistical Consulting Service Revamped
- Graduate Profiles
- Departmental Awards
- Congratulations to Our Graduates
- New Faculty
- Grad Student Corner
- Sports Update


## Bayesian Analysis of Response Time Data

Studying the length of time that it takes a subject to respond to a given stimulus, i.e., the subject's response time (RT) to the stimulus, has long been a topic of interest among cognitive psychologists. With research funding from the National Science Foundation, Professor Trisha Van Zandt of the OSU Psychology department and Professor Mario Peruggia of the Statistics department are developing accurate Bayesian models and computational methods for RT analysis.

How well a person performs a task is often evaluated by way of how quickly he or she can respond during the task. Measurements of RTs are important for both theoretical and pragmatic reasons. Theoretically, RTs are used to test

*(continued on page 9)*

## Letter from the Chair:

# 2004: *Clickety-Clack the Train is Back In the Wheelhouse with New Travel Orders*

*By Doug Wolfe*

Doug Wolfe

Last summer we welcomed a new dean, Richard Freeman, to our College of Mathematical and Physical Sciences, and that has had tremendous influence on our Department of Statistics during this past year. A self-described "Mario Andretti on the racing edge," Rick has injected new life and leadership into the college and instilled a Silver Streak mind set in all his conductors. At times this has found us gasping for air just to keep up, but at other times we have been able to sense the thrill of a well-run race and enjoy the sweet rewards of a good finish. Many of these changes are documented elsewhere in the newsletter. I will concentrate here on the faculty and staff of our department.

### Faculty Awards and Honors

This has been a year filled with awards and honors for our faculty. Shili Lin and Mario Peruggia were selected as Fellows of the American Statistical Association. Jason Hsu spent a quarter in Iceland working on genetics research as a Fulbright Scholar. Michael Browne was honored with a Distinguished Lifetime Achievement Award in Multivariate Experimental Psychology by the Society for Multivariate Experimental Psychology. Bill Notz will complete his term as editor of *Technometrics* at the end of this calendar year. Noel Cressie was awarded the title of Distinguished Professor of Mathematical and Physical Sciences at Ohio State. Finally, Prem Goel was a member of the research team that was selected to receive the 2004 Lumley Interdisciplinary Research Award from the College of Engineering.

Please join me in congratulating these faculty members who have been honored with such prestigious awards this year.

### Personnel Changes

Once again, change has been the norm for the department, but this time it involved real expansion in faculty and staff rather than just replacement hiring.

Our new dean hit the College running and gave us the green light to conduct searches for an unspecified number of new faculty at all academic levels. We took him seriously and the Executive Committee spent a busy December and January reading over 130 applicant files! Then it was the entire faculty's turn to contribute by serving as host for 16 applicant interviews. From this group, we have been fortunate to hire two outstanding new faculty members for our department, one senior and one entry-level. Both will join us in autumn quarter 2004, bringing the number of full-time faculty on our Columbus campus to 25. I am pleased to introduce them to you (for more details, see separate article in the newsletter).

Arijit Chakrabarti from Purdue University is joining our faculty as a new assistant professor. Arijit's dissertation research involves statistical model selection techniques for high or infinite dimension problems using a Bayesian approach. He also has an interest in working collaboratively with biologists to address challenging questions in genomics.

Tailen Hsing joins our department as a full professor. He received his Ph.D. from Oxford University and comes to us from his current position in the Department of Statistics at Texas A & M University. His research interests currently include bioinformatics and data analysis/curve estimation, but he brings substantial expertise in probability and limit theorems and their applications to extreme value theory and long-memory time series. We anticipate that he will establish an important collaborative research link with the Biomedical Informatics and Human Cancer Genetics programs in the College of Medicine.

Jackie Miller has been a ball of fire in her new role as a statistics education program specialist for the department. Not only does she teach our introductory courses better than I thought possible, but she does it with a smile! Her rapport and effectiveness in working with our graduate teaching associates are exceptional. Jackie has done such a fine job that we decided to hire a second statistics education program specialist! Welcome back to Deb Rumsey, a Ph.D. graduate from our program who worked with Elizabeth Stasny. Deb joined our department in spring quarter 2004. This dynamic duo is already working on new and exciting ways to teach our undergraduate service courses as well as planning (plotting??) additional undergraduate course offerings and an improved statistics minor (for more details, see separate article in the newsletter).

The Statistical Consulting Service (SCS) continues to grow under outstanding leadership from Tom Bishop. The number of graduate students and faculty across the university being served by the SCS has steadily increased throughout the year. This growth has led to hiring Jeni Squiric to help Tom coordinate and manage the Consulting Service activities and projects. We welcome Jeni to our department (for more details, see separate article in the newsletter).

Finally, Mary Turner resigned her staff position in the department to accept a similar position elsewhere in the university. We are pleased to introduce everyone to Kathy Stone (Patty Shoults' not-a-twin sister) who has been hired to fill this vacated position.

### Summer Research Experience for Undergraduates

The Department of Statistics is winding down its summer Research Experience for Undergraduates (REU) Program due to lack of a consistent source of funding. In our fourth and final summer we will host a single REU participant, Ms. Lee Strassenberg from Pomona College in California. She will be working with Haikady Nagaraja on a longitudinal study of lupus, an autoimmune disease affecting mostly women.

### Starlight Express

I am very thankful for the outstanding faculty, staff, and graduate students in our program for the many good things that happened in our Department of Statistics over the past year. As I turn my attention to another four exciting years with these dynamos, I feel a bit like Rusty the Steam Engine from the Andrew Lloyd Webber musical *Starlight Express*. All around me are electric, diesel, and bullet express trains carrying our department to bigger and better things, and I must keep stoking the furnace and piling in the coal (environmentally treated, of course) to keep my little steam engine chugging along just to keep up with their accomplishments! I surely hope that maestro Webber knew what he was talking about when he suggested that steam can still keep pace! See you next year when it is time to once again slow down long enough to report on our department.

## MBI Year to Focus on Genomics, Proteomics, and Bioinformatics

Under the direction of Avner Friedman, the Mathematical Biosciences Institute (MBI) has just completed its successful emphasis year on cellular processes and is looking forward to an exciting year in 2004–2005 that focuses on genomics, proteomics, and bioinformatics.

The year begins with a tutorial from September 13–17 on microarrays taught by Chandan Sen of Ohio State's Davis Heart and Lung Research Institute. The following week Nick Jewell from the statistics and biostatistics programs at University of California, Berkeley, will teach a tutorial on statistical methods for genomics. Key highlights of the year include fall workshops on expression data (October 11–15) and regulatory networks (November 8–12); winter workshops on proteomics and mass spectrometry (January 11–14) and on emerging technologies and data integration (February 21–24); and spring quarter workshops on HIV and cancer biomarkers (April 18–22) and on evolutionary genomics (June 13–17).

About one-third of the statistics department faculty will play substantial roles in the MBI this year. Shili Lin will be taking her sabbatical in residence at the MBI and is organizing the expression data workshop with Terry Speed. Hani Doss, Jason Hsu, Yoon Lee, Haikadi Nagaraja, Tom Santner, and Joe Verducci have all received release time (paid by the college!) in order to allow their heavy involvement. Shili, Tom, and Joe will all be mentoring MBI post-docs and Dennis Pearl continues as an associate director of the Institute. In addition, statistics students Qianqiu Li and Kevin Tordoff are working with Dennis and Xiaotong Shen on the Pfizer-sponsored MBI project on biomarkers of liver toxicity.

There is no registration fee for any MBI programs, but space is often limited. Go to http://mbi.osu.edu to view the details of the programs and to see how you can participate.

**Department of Statistics News**
Volume 12, 2004

Department of Statistics
The Ohio State University
1958 Neil Avenue
Columbus, OH 43210-1247
(614) 292-2866
(614) 292-2096

Editor:
Mike Fligner

The *Department of Statistics News* is an annual publication of the Department of Statistics at The Ohio State University.

www.stat.ohio-state.edu

## Undergraduate Statistics Efforts Aim to Increase Student Confidence Beyond 99.7%

The undergraduate courses in statistics continue to be very popular with students, and enrollments are on the increase. With plans to move ahead in developing courses for a statistics minor, and eventually a statistics major, the department is looking forward to many exciting new developments in the undergraduate program in the near future. Jackie Miller and Deb Rumsey will be leading these efforts as the new department statistics education specialists. Jackie joined the department in July 2003 and Deb in April 2004. Both Jackie and Deb received their PhDs from Ohio State and had academic positions before returning to OSU. Their current focus is on curriculum design and development, teaching and learning environments and assessment, and teacher training and support. They will work closely with the newly formed faculty Undergraduate Curriculum Advisory Committee to achieve department goals in statistics education.

Jackie Miller

One of Jackie and Deb's first major efforts will be the development of teaching and learning systems for our undergraduate courses, starting with Stat 145. Each learning system will contain a course packet for students, including lecture outlines, tables, and fully integrated lab activities, which will include additional exercises and examples and how-to information regarding course technology. All of the course materials will make clear connections between lecture and recitation in a seamless format. Students will be able to listen and participate more in class, and will have to spend less time taking notes. Each teaching system will contain an instructor packet, including PowerPoint presentations, student lecture outlines with all notes filled in, tables, lab activities, and additional examples and exercises with solutions. PowerPoint presentations will include a basic outline of the big ideas and examples that can be included or easily replaced as the instructor desires. Teaching systems will be designed to create clear, consistent, and easy-to-use framework for instructors to use to teach these courses, yet will allow for and encourage their own personal teaching styles.

Deb Rumsey

This year, Ohio State devoted some money from the student tuition increase to technology development for deserving departments. The statistics department submitted a proposal for equipment and personnel to enhance and support our teaching efforts involving technology. Our proposal received a priority ranking from our college, and we have been told that we received $91,000 cash and $100,000 in continuing funds.

### First U.S. Conference on Teaching Statistics Planned at Ohio State in 2005

The first United States Conference on Teaching Statistics (USCOTS) will be held on May 19–21, 2005, at The Ohio State University, hosted by CAUSE, the Consortium for the Advancement of Undergraduate Statistics Education.

USCOTS will be an active, hands-on working conference for teachers of statistics at the undergraduate level, in any discipline or type of institution, including high school teachers of AP Statistics. The theme of the 2005 USCOTS is "Building Connections for Undergraduate Statistics Teaching," and will focus on ways that we can share teaching ideas, develop working relationships, and identify areas for future collaborations and projects at our own institutions. For more information about USCOTS, contact Deborah Rumsey, USCOTS program chair at rumsey@stat.ohio-state.edu.

### Ohio Statistics Conference: Friday, October 22

The annual Ohio Statistics Conference is being held at Ohio State this year. The concentration of the conference is promoting careers in statistics. The audience is primarily undergraduate students across the state of Ohio as well as local AP statistics students and their teachers.

For more information about the Ohio Statistics Conference, or if you are interested in participating as a speaker, please contact Jackie Miller, program chair, at miller.203@osu.edu.

### Rumsey Publishes *Statistics for Dummies*

Deb Rumsey published the book *Statistics for Dummies* in September, 2003 (John Wiley and Sons). The book was written as a supplement for students in introductory statistics and as a "how-to" book for the public to be able to understand, interpret, and evaluate statistics in their everyday lives.

## Statistical Consulting Service Revamped

Tom Bishop

The Department of Statistics re-opened the Statistical Consulting Services (SCS) last October under the guidance of Dr. Tom Bishop, director, and Ms. Jeni Squiric, operations manager. The SCS has formalized and expanded the structure of the consulting activities to provide a broader range of consulting services to Ohio State students and faculty. Today the SCS functions much like an independent consulting firm.

The SCS mission is to provide professional statistical consulting support to students and faculty in the areas of: design of experiments; survey analysis; statistical modeling; data analysis; and database development. The SCS employs Ph.D. and master's level graduate students from the Department of Statistics as consultants. SCS consultants provide collaborative support in the planning, design, and management of research projects, and they gain valuable experience in the application of the statistical theory learned in the classroom through direct involvement and management of faculty and student projects.

To date, the SCS has completed over 114 projects from 56 different colleges and departments, including the College of Education, Department of Psychology, School of Veterinary Medicine, School of Music, and the Department of Food, Agriculture, and Biological Engineering.

SCS consultants have worked on a number of interesting projects. The SCS is concluding the analysis of data from a large survey for the State of Ohio. This survey is intended to investigate the distribution of rates charged by child care providers. It is a challenging study because there are 30 distinct child care service categories with a limited amount of highly correlated data in each category. A functional analysis methodology is being developed to estimate the 75th percentile within each category. The results of this study will be used to determine the rates the state will pay to subsidized child care support for low income families. In addition, further research is being conducted with the help of the Department of Statistics faculty members to develop a new methodology to cluster child care providers with similar rates.

The SCS is currently involved in a study for the anthropology department to compare the growth rates between children of Neanderthal and modern man. Growth patterns in children are defined by counts of perikymata rings on the enamel tooth surface. The SCS consultants are using nonlinear growth models and nonlinear regression techniques to compare the two groups to determine if modern children are maturing at a slower rate than Neanderthal children.

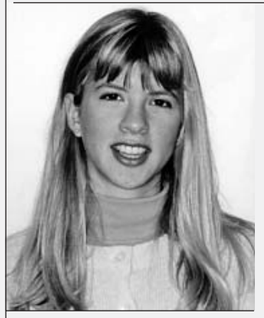
SCS consultants have been involved in a number of designed experiments for the food and science technology department. These experiments are focusing on faster and cheaper methods for preparing processed foods. One experiment involves the execution of a Latin square design to establish the effect of milk medium and coagulation medium on the hardness, springiness, and cohesiveness of cheese. A similar experimental design was run to establish the effect of milk medium and starter culture on the propri-onic and acetic levels in the final cured cheese blocks. This design created interesting, but difficult, analysis issues because several treatment groups failed to produce satisfactory responses which created an unbalanced, incomplete block design.

Several consultants have been involved in the analysis of the effect of four distinct methods of saturating the

*(continued on page 11)*

## *Graduate Student Profiles — Two Perspectives*

### Kristin Duncan



Unlike many of my classmates, I did not have too far to travel in the summer of 1999 when I finished my bachelor's degree in math at the University of Dayton and headed east to Ohio State. It's a good thing, too, because looking back over the last five years, I estimate I've made the round trip between Dayton and Columbus just shy of 200 times! At first, I made the trek for the free laundry facilities at my boyfriend's, but after getting married, I became a full-time Dayton resident. Now that I have wrapped up a short stint teaching at the University of Cincinnati, I hope to graduate before I work my way through the entire collection of books on tape at my local library.

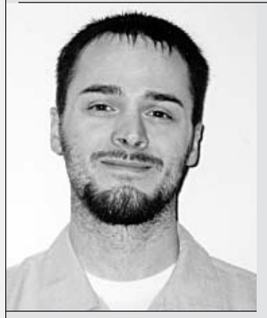
When I decided to come to Ohio State, I was concerned about being "just a number" at a large state university. I quickly learned, however, that the folks in the statistics department look after their students. The office staff has always been tremendously helpful; Paul can take care of anything from making sure you are paid to moving your desk, and Patti knows exactly how to handle all the graduate school and university bureaucracy. Having in-house computer staff is quite a luxury. Brian, Eric, and the gang were very generous when I asked for more disk space, and I always received a quick and helpful response when I e-mailed the computer staff at support@stat.ohio-state.edu. Dr. Wolfe was the graduate studies chair at the time I arrived and advisor to our incoming class. My quarterly "pep talks" with him did a great deal to see me through my studies and exams.

As a member of the grad recruitment committee, I enjoyed many a free lunch, even though I never became fully certified to use the department charge card. It was nice to be able to tell the prospective students honestly what a friendly and congenial department we have. I had the most fun my second year when several of us shared an office in 413. We ate lunch together, had birthday parties, a pizza party with proceeds from the sale of a textbook left in our classroom, and even a baby shower. The next year one of my classmates hosted a potluck Chinese New Year party. When I lived in Columbus, I played on the softball team despite a severe lack of hand-eye coordination. We did have some real talent on the team, but I contributed mostly by showing up so that we would have enough people to play.

Besides sporting endeavors, summers brought many excellent opportunities for me to broaden my educational experience. I worked as a summer fellow at the Center for Survey Research (CSR) with Dr. Stasny for two summers.

*(continued on page 7)*

### Shawn Lavy



After receiving my B.S. in zoology from Miami University, that age-old question came up, "Now what am I going to do?" Having some experience working in hospital laboratories during my undergraduate days, I made the decision to become a medical technologist. I completed the clinical year of the medical technology program at Wright State University and received my technologist certification. For the last 10 years, I have been working full time on third shift (10 p.m. to 8 a.m.) in a hospital laboratory. It was during this time that I started taking math classes, just for fun.

When I married and relocated to Columbus, I continued taking math courses at Columbus State Community College. It wasn't long before I had completed most of the undergraduate math classes available. A professor at Columbus State urged me to put my recreational interest in math toward a master's degree. I researched graduate programs on The Ohio State University web site and "randomly" selected statistics. I never spoke with anyone in the program in person, and as a result of outdated Ohio State web page information, I actually sent my application to the wrong person. I do not recommend my admissions strategy to anyone. Despite the mix-up, I was accepted into the program and started in the summer of 2000. I planned to take one class at a time while continuing to work full time at the hospital. My third shift schedule allowed me to take classes during the day. Unfortunately, that schedule didn't allow for much of anything else (like sleep).

My first class, Stats 602 with Dr. Wolfe, was a great preparation for future classes. I highly recommend that incoming students take advantage of this Early Start Program. Still undecided about the type of degree I wanted, I then took the 620 theory classes. I soon felt overwhelmed. I was trying (and not succeeding) to do the work on my own. Dr. Stasny encouraged me to work with the other students. As I became acquainted with my classmates, I realized how invaluable it was to have that support system. It was gratifying to discover how all the students were willing to help each other and learn from each other. These working relationships soon became lasting friendships that I still cherish today. Since I was taking one class at a time, my friends in the program would move on and graduate and I would develop a new set of friends with whom to share the academic journey. As I advanced through the course work, I also began communicating more with my professors. Without exception, I found the professors in the statistics department easy to talk to and very willing to help me learn the course work and advise me in my future pursuits.

*(continued on page 7)*





### Kristin Duncan
*(continued from page 6)*

It was fascinating to learn about the operations of the CSR and to see how social scientists use statistics. My first project looked at ways to account for coverage bias in telephone surveys, and in the second year, I dabbled a little bit in crime (crime statistics anyway—nothing illegal). These summer projects were a great way to begin my research career, and I am very thankful to Dr. Stasny for being a marvelous advisor and editor. Three years later, I was able to present this work for some of my job talks when the audience or time frame called for something more accessible than my dissertation.

I also served as a graduate assistant for the department's Research Experience for Undergraduates program in its first two years. It was both fun and rewarding to be a part of the development of this program together with my co-GA Marilisa. The program recruits top undergraduates from around the country. Each student is teamed up with a researcher in the biological or social sciences and a statistician to work on a project during their eight weeks on campus. The students were smart, energetic, and entertaining, and they completed some fantastic projects. I learned a great deal about interacting with researchers in other fields and am pleased that the program has been successful in attracting top-notch students to our graduate program and getting the word out to undergraduates about what a great department we have.

After making it through qualifiers, I have been working on my dissertation with Steve MacEachern. The main portion of my dissertation looks at Bayesian cross-validation, but my expert advisor noticed my interest in item response theory and helped find a way to work that into my thesis as well. I have come to realize as my classmates and I have moved through this portion of our studies, that a dissertation advisor has a much different job than that of a regular course instructor. An advisor does not just give you a problem to solve, but rather trains you to become a researcher. My earlier course work served to develop my technical skills, but as I have been working on my dissertation, Dr. MacEachern has taught me how to ask good questions. I am grateful to Steve for his guidance and for giving me the right encouragement to discover things on my own.

This fall my husband and I will move to Chicago. He will get to take his turn going to graduate school, and I will be a visiting professor at DePaul University. I am a little bit anxious about leaving the central Ohio area I have called home for the last nine years but excited to be heading out for new adventures. I will miss my friends and classmates from Ohio State, and I look forward to reuniting with all my fellow Buckeyes at future Joint Statistics Meetings!

### Shawn Lavy
*(continued from page 6)*

Having decided on a master's degree in applied statistics, I needed time to study for the MAS exam. With my full schedule, time management had always been a challenge. My fourth (and last) year offered additional challenges. My wife and I were expecting our first child, I needed to study for the MAS exam, and I had several more classes to complete before graduation. During my last two quarters, I decided to work part time in order to double up on my class schedule and study for the exam. The MAS exam was May 13 and my wife's due date was May 30. (We were hoping the baby wouldn't come early.) Actually, she did come early, but luckily not until after I had taken the exam. I found out I passed the exam, and two days later my daughter was born. Alyssa Jean Lavy was born May 20th, 2004 at 9:03 am. For all you stats people, she was 6 lbs. 15 oz., and 18 inches long. On her two-week checkup she was 7 lbs. 2 oz., 19 inches, 25th percentile in weight, and 10th percentile in length. She is a little one, but growing well. She was born at The Ohio State Medical Center, and while I stayed with my wife in the hospital, I was able to walk to class. Between studying for finals and caring for a newborn, I admit I was a little sleep deprived.

Since graduation, I have been taking a break from my hectic schedule while I look for a job and spend time with my new daughter. I had a wonderful experience at Ohio State, and encourage anyone who wants to combine working full time with getting a master's degree to go for it. My advice for all new students is not to do it alone. Talk with your professors; they are full of good advice. Get to know your classmates, learn from each other. This is an experience that is better shared with your new statistics friends. One last time, I want to thank everyone (all my professors, staff, and fellow students) for all the help and encouragement. I am proud to have a master's degree from the statistics department at Ohio State.

*Congratulations to our Award Winners!*

## Departmental Awards

Dave Wuenschell accepting Powers Award for outstanding lecturer from Mike Fligner at the spring awards picnic.

### POWERS TEACHING AWARDS

The Thomas and Jean Powers Teaching Awards are presented each year in two categories to (1) the best TAs teaching either recitations or lectures, and (2) an outstanding professor in the department. These awards were instituted in 1986 through a generous gift to the Statistics Development Fund by Tom and Jean Powers.

The department is lucky to have a large number of excellent graduate teaching associates. The selection of the best TAs is never an easy task, and there are always a number of extremely good teachers who are runners-up for the award. In 2003-04, the award for best TAs were presented to Jonathan Powell and David Wuenschell. Each of these TAs made an outstanding contribution to the teaching mission of the department. The faculty award was presented to Professor Angela Dean.

### WHITNEY AWARDS

In 1992, Professor Emeritus Ransom Whitney and his wife Marian Whitney made a generous gift to the Statistics Development Fund to institute several awards for graduate students. In 2003-04, the winners of the best consultant in the Statistical Consulting Service were Cheryl Dingus and Shiling Ruan. The award for the best research associate was shared among Yongku Kim, Eric Lam, and Jun Feng Sun. The award for best research leading to the Ph.D. was awarded to Yufeng Liu. We congratulate these people and thank them for their hard work.

### CRAIG COOLEY MEMORIAL PRIZE

The Craig Cooley Memorial Prize for 2003-04 was awarded to Subharup Guha. Each year this award is presented to a graduate student in the department demonstrating exceptional scholarly excellence and leadership abilities. Craig embodied these two qualities throughout his graduate career. Tragically, he was killed just before receiving his Ph.D. in 1996. To honor his memory, the department created the Craig Cooley Memorial Prize. For additional information about contributing to this fund, please see below.

### UNIVERSITY FELLOWSHIPS

Single year University Fellowships were awarded to Brady Brady, Elizabeth Cornett, Crystal Dong, Danel Draguljic, John Draper, Jessica Gebler, David Kadonsky, Prasenjit Kapat, Christopher Sroka, and Zhen Wang. In addition, Melissa Ludack and Shari Modur were awarded Graduate Enrichment Fellowships.

### INDUSTRIAL FELLOWSHIPS

Each year the Department of Statistics is able to offer special recruitment fellowships to some of the very best new applicants to our graduate programs. These fellowships are funded through the generous support of sponsoring industrial organizations, for which the department is always grateful. The sponsoring organizations, their fellowship stipend amounts and the 2003–04 student recipients are as follows:

#### Lubrizol Foundation Fellowships

An award in the amount of $3,000 is provided by the Lubrizol Foundation. The 2003–04 recipients were Crystal Dong from Ohio Wesleyan University and Danel Draguljic from Millersville University.

#### Battelle Fellowship

An award in the amount of $5,000 is provided by Battelle. The 2003–04 recipient was Christopher Sroka from Wayne State University.

#### P&G Fellowship

An award in the amount of $5,000 is provided by P&G. The 2003–04 recipient was John Draper from Florida State University.

#### Wyeth-Ayerst Fellowship

An award in the amount of $3,000 is provided by Wyeth-Ayerst. The 2003–04 recipient was Jessica Gebler from Marquette University.

We appreciate all the support from the Lubrizol Foundation, Battelle, P&G, and Wyeth-Ayerst.

### CHAIR FELLOWSHIPS

Single year awards in the amount of $1500 or $3000 are provided through the department as Chair Fellowships. The 2003–04 recipients were incoming students Brady Brady, Elizabeth Cornett, Melissa Ludack, Karen McEachrane, Colin O'Rourke, Bryan Ray, and Clint Roberts.

### THANK YOU!!

We wish to say a special thank you to all of you who help support our department activities through your donations to the University. You are helping to make lives richer for the students who are following in your footsteps. We encourage you to specify your University donations to be applied to one of the following statistics department funds. Keep in mind that memberships in the Presidents Club can also be designated to one of the following funds.

**Powers Award** - Teaching awards for graduate students and faculty -Fund # 525898

**Whitney Scholarship** - Awards for consulting and research for graduate students- Fund # 536826

**Rustagi Memorial Lecture** - Fund # 526245

**Statistics Support Fund** - Includes support for visiting colloquium speakers, conference travel awards for graduate students, and the Craig Cooley Memorial Award - Fund # 537669





From left to right: Cheryl Niermann, Mario Peruggio, Trisha Van Zandt.

## Bayesian Analysis of Response Time Data

*(continued from page 1)*

hypotheses about cognitive structure, the ways in which people use and process information, and how changes in the environment influence human behavior. Pragmatically, RTs are important for evaluating human performance in many areas. They assist machine interface design decisions, such as the optimal way to present information to a pilot or the best place to put a turn signal lever. They are also used in medicine; diagnoses of some organic brain disorders such as Alzheimer's disease or Attention Deficit Hyperactivity Disorder can be informed by a patient's RTs on certain kinds of tests.

Many of the statistical procedures used to test hypotheses based on RTs are suboptimal. They depend on oversimplifying assumptions about RT data that are usually incorrect, and consequently the inferences that are made about RTs collected in different environments can be faulty. One goal of our project is to develop a more accurate characterization of RT data leading to improved decision-making about human capabilities and disease.

Although Bayesian techniques are well-established in other fields, social scientists do not use them often because they require a considerable investment in computational resources as well as additional statistical training. We are developing a number of strategies that will improve the analysis of RT data, including analyses that consider theories about how RTs are produced and new procedures that can help untrained practitioners use Bayesian methods without too much inconvenience.

Several people have been actively involved in various stages of the project, including two undergraduate students, Emily Johnson of Dartmouth College and Maria Salotti of University of Wisconsin at Stevens Point, who participated in our department's successful REU programs in the summers of 2002 and 2003. Professor Peter Craigmile (Ohio State, Statistics) has also been a collaborator, contributing his expertise in the analysis of time series data that exhibit long-range dependence. Cheryl Niermann has been a graduate research assistant on the project since summer 2003, exploring interesting computational aspects. Cheryl and Mario will give presentations on some current developments at the Joint Statistical Meetings to be held this coming August in Toronto, within a special contributed session on "Bayesian Methods in the Social Sciences." The session will also include presentations from Kristin Duncan (Ohio State, Statistics), Greg Allenby (Ohio State, Marketing) and Jun Lu (University of Missouri-Columbia, Statistics). If you are at the meetings and are interested in hearing how Bayesian methods are applied in a variety of social sciences contexts, please drop by!

Reception for Noel Cressie being honored as Distinguished Professor of Mathematical and Physical Sciences.

## Welcome New Faculty!

### Arijit Chakrabarti


Arijit Chakrabarti

I was born in a small town on the outskirts of Calcutta, India. I received my undergraduate education at Presidency College, Calcutta with a Statistics major. Afterwards, I worked on a master's degree at the Indian Statistical Institute with a specialization in Mathematical Statistics and Probability. I graduated from ISI in 1996 and took up a job with a consulting company. I left the job and came to the United States in 1999 as a Ph.D. student in the Department of Statistics at Purdue University. I will finish my doctoral research in August 2004. My advisor is Professor Jayanta K. Ghosh.

My research has been in the area of model selection for high or infinite dimensional problems. I looked into the problems of model selection in the context of function estimation in the Gaussian White-Noise model and Nonparametric Regression model. This led to a proof of decision theoretic optimality of some well-known model selection criteria (or modifications thereof) as well as new Bayesian model selection rules. I also proposed a generalization of the Bayes Information Criterion suitable for high dimensional problems and studied this new criterion theoretically and computationally. In the next few years, I want to continue working on other relevant problems on model selection in high dimensional setup and function estimation. I would also love to be involved in interdisciplinary research.

I am interested in music, films, and literature. I love listening to Indian classical music and jazz and watching international films. I had some limited training in singing in my teens and enjoy singing a lot. Last but not the least, I love watching cricket, my only panacea. I got married to my wife Madhumita in 2002. My parents and my younger brother live in Calcutta, India.

I will join the Department of Statistics at The Ohio State University in September 2004, and I am really looking forward to it. I think that there is an excellent match between my research interests and those of many of my future colleagues. I will also have a variety of interesting courses to teach, which I want to do very seriously throughout my academic life. I hope Ohio State will be an ideal place for me to learn and contribute to my discipline.


Tailen Hsing

### Tailen Hsing

I am very pleased to be in a position to introduce myself in this newsletter. I am originally from Taiwan. My doctorate degree was obtained from the University of North Carolina at Chapel Hill. I have worked in a number of places in the U.S. and abroad, most notably Texas A&M University and National University of Singapore. Based on what I have seen, I rank the combination of Columbus and The Ohio State University as one of the most exciting for an academic statistician. I am looking forward to an interesting professional and personal experience in Columbus.

My research interests can be largely grouped into four areas: extreme value theory, long-memory time series, functional data analysis (FDA), and bioinformatics, where the first two areas represent my past interests and the last two my present interests. Extreme value theory and long-range dependence are, in my mind, extremely important areas from both the theoretical and practical perspectives. However, at some point in the past few years, I concluded that I had worked in these areas for too long and that I ran out of good ideas. So I decided to step away, and FDA and bioinformatics came naturally to me.

FDA considers data analysis problems in which the data are functions. There is no shortage of such data in our everyday life, a result of our ability to generate and store data in the modern world. Although I still consider myself a student in FDA, I am making steady progress. A goal for the next few years is to publish a book in FDA. Bioinformatics is field that has enjoyed a high profile recently. The progress in science and technology makes this an ideal time to engage in research in bioinformatics. I have done some work related to the analysis of microarray data. I would like to learn more biology and computing in the next few years to be able to understand the statistical issues in gene regulatory networks.

### Understanding the Flow Mechanism in Ice Streams and Glaciers

*(continued from page 1)*

Second, the key objects of scientific interest, namely forces acting to control ice flow, are not observable directly. Hence, we need to combine models and observations to develop inferences for forces. We also need to accomplish this in a fashion that manages the uncertainties. Hierarchical Bayesian analysis provides a mechanism for tackling the problem.

We are developing analyses for the Whillans Ice Stream, which drains in to the Ross Ice Shelf in Antarctica. We also are analyzing a portion of the Northeast Ice Stream in Greenland. Understanding and comparing behaviors of such seemingly different ice-stream systems is a fundamental portion of the research.



### Statistical Consulting Service Revamped

*(continued from page 5)*

waste material in landfills to speed up the decomposition process. In this experiment, sensors were placed spatially within the landfill, and the change in moisture content after saturation was recorded. A response surface was fit to the data to generate a moisture profile within the landfill for each of the four experimental methods. These response surfaces were then used to select the method yielding the highest moisture content within the landfill.

The SCS consultants are also engaged in the analysis of the relationship of yes/no responses to questions related to willingness to pay increased taxes to support curbside recycling programs to respondent demographic data. This project involves research comparing the properties of ordinary least squares and logistic regression estimates of parameters in econometric taxation models.

Through these various projects, SCS consultants are also gaining experience with project management, database design, computer programming, simulation analysis, and many other statistical techniques.

As SCS activities continue to expand, there will be new opportunities for graduate students in the Department of Statistics to gain practical experience in consulting by joining the SCS staff.

## Annual Spring Picnic


Students and faculty enjoying the beautiful spring picnic weather.


Eric Drake frying a turkey, the new picnic "treat."


A "lively" game of volleyball with Dr. Stasny's children.

# Grad Student Corner

## Our Ph.D. Graduates Prepare To Make Their Marks

We are proud of this year's bumper crop of Ph.D. graduates! They are making their marks in statistics from some very prestigious positions, as you can see from the list below:

**Swati Biswas**: Postdoctoral Fellow, Department of Biostatistics, University of Texas, MD Anderson Cancer Center

**Haiying Chen**: Assistant Professor of Biostatistics,Wake Forest University

**Kristin Blenk Duncan**: Visiting Assistant Professor, Department of Mathematical Sciences, DePaul University

**Subharup Guha**: Postdoctoral Fellow, Department of Biostatistics, Harvard University

**Nicole Kelbick**: Senior Consulting Research Statistician, OSU Center for Biostatistics

**Yufeng Liu**: Assistant Professor of Statistics and Operations Research (Statistics), The University of North Carolina, Chapel Hill

**Martina Pavlicova**: Assistant Professor of Biostatistics (Psychiatry), Columbia University

**Yuxiao Tang**: Assistant Professor of Internal Medicine (Statistics), Rush University Medical Center

**Qiang Wang**: Senior Statistician, Abbott Labs

## Statistically Significant News From Former Students

**Peter Beshuk** (MS, 1984) is an enrolled actuary at Ohio National Financial Services. He is currently doing product development work in life insurance. John Felix' sister (Terri) is a coworker. Peter says hello to John Bath, Paul Wood, and all his other friends from OSU.

**Mario Davidson** (MS, 2002) and wife, Anita, became new parents on May 14. Xayvion Antonio Davidson weighed in at 5 pounds, 15 ounces, and was 20 inches long.

**Juan Du** (current student)and her husband, Yufeng Liu (Ph.D., 2004), are the proud parents of a son, Andrew Haolin Liu, who was born March 12. The summary statistics were weight 8 pounds, 1 ounce, and height 20.25 inches.

**Anthony C. Hamlett** (MS, 1993) began working for Bristol-Myers Squibb Pharmaceutical Research Institute in 2003 where he is currently a research biostatistician. After leaving Ohio State in 1993, he went on to receive his Ph.D. from the University of Rhode Island in 1999. He then taught undergraduate statistics for one year and did a two-year post-doc at the Harvard School of Public Health before joining Bristol-Myers Squibb.

**Yongdai Kim** (Ph.D., 1997) started a new position this year at Seoul National University, Korea.

**Ellen Mecklenburg** (MAS, 2003) is happy in her position as a survey methodologist at N.O.R.C. in Chicago.

**Tom J. Shannon Jr.** (MAS, 1992) has been an associate at Health Data Management Solutions of Beachwood, Ohio, since December 2002 (www.hdms.com). He works from home in Grand Rapids, Mich. (work phone 616 459-7278, e-mail tshannon@hdms.com), where he prepares health insurance claims datasets for analysis. He primarily uses base SAS for data processing and analysis. Tom married Kristen (Galle) Shannon in April 1998. Their first child is a daughter, Alexandra (Lexy) Shannon, who was 3 years old in June. A second child is expected in October! Tom plays guitar in a band, The Cheeztones! (see www.geocities.com/cheeztones), and is active in the Toastmasters Club.

**Zhengda Shen** (MAS, 1997) was the winner of the 2002 Chairman's Award from Merkle Direct Marketing, Inc. Shen was selected as the fourth recipient of the annual award from more than 700 employees for his exceptional contributions in analytics and marketing. To acknowledge this achievement, Merkle has awarded Shen the Chairman's Award commemorative plaque plus a two-year lease on a steel-blue 2003 BMW 330i.

**Theresa Papa Stern** (Ph.D., 1997) gave birth to twins Madison Ann and Andrew Jonathan on May 1. Theresa is thankful that the twins lives so far have been uneventful! She also reports that dad, mom, and big sister Alexa are doing well.

**Darryl Yamashita** (Ph.D., 1993) is the manager of Data Mining for Wachovia Bank with a database marketing firm named Bridgetree based out of Charlotte, N.C. Darryl's second son, Jonathan, was born last June. Darryl reports that Jonathan is a real joy in their lives (along with big brother David and big sister Beth).

## In Memoriam

We are very sad to report that Jennifer Rossi (MAS, 1997) passed away on May 15. We remember Jennifer as a friendly student who was one of the instigators in getting the SAS class started. We extend our deepest sympathy to Jennifer's family and friends.

CURRENT STUDENTS AND ALUMNI - SEND US YOUR NEWS FOR THE GRAD STUDENT CORNER. CONTACT EITHER MIKE FLIGNER (maf@stat.ohio-state.edu) OR ELIZABETH STASNY (eas@stat.ohio-state.edu)



Doug Wolfe and Saul Blumenthal updating Jagdish Rustagi on the state of the department at the annual Rustagi reception.

## Our Students Are Real Winners!

Three of our students were finalists in the OSU Edward F. Hayes Graduate Research Forum this spring. Third-year student Jesse Frey won third place in the Physical and Mathematical Sciences division. The three students and the titles of their papers were:

**Roxana Alexandridis**: "Class Discovery and Classification of Tumor Samples by Gene Expression Profiling"

**Jesse Frey**: "A Ranking Method Based on Minimizing the Number of In-sample Errors"

**Junfeng Sun**: "Stochastic Models for Compliance Analysis in AIDS Clinical Trials and Application"

**Soma Roy** and **Qingzhao Yu** both won Summer Research Awards through the OSU Center for Survey Research. The award funds them to do original survey research this summer. Qingzhao is working on improving estimates of rape and domestic violence in the National Crime Victimization Survey data. Soma is working on multiple imputation for missing fathers in the Fragile Families data set.

At the national level, **Bidisha Mandal** (MS, 2003) was a winner in the student paper competition sponsored by the ASA's Government Statistics Section, Social Statistics Section, and Section on Survey Research Methods. Bidisha will present her award-winning paper, "Imputing Missing Income Data and Weighting Data with Imputed Income," at the Joint Statistics Meetings this summer. She was supported to do this research through a Graduate Student Summer Research Awards from the OSU Center for Survey Research during Summer 2003.

## Our Students Keep On The Move With Travel Awards!

**Roxana Alexandridis** won a Ray Travel Award from the OSU Council of Graduate Students to present her work, "Discovery and Classification of Cancer Types using Gene Expression Analysis," at the American Society of Human Genetics 53rd Annual Meeting last fall. Roxana's work is joint with S. Lin and M. Irwin of Harvard University.

**Haiying Chen**, **Xiaobai Li**, and **Qingzhao Yu** are all winners of travel awards from the ASA Section on Survey Research. They each won $400 to attend the Joint Statistics Meetings in Toronto this summer, and also may attend one of the Continuing Education Courses offered by the Section at the JSM.

**Kristin Duncan** won a $300 travel award from the ASA Section on Bayesian Statistical Science to present her research, "Parametric and Nonparametric Bayes Models for Item Response," at the Joint Statistics Meetings in Toronto. Kristin's work is joint with S. MacEachern

**Cheryl Niermann** won a $300 travel award from the ASA Section on Bayesian Statistical Science to present her research, "Fitting Response Time Models by Adaptive Importance Sampling," at the Joint Statistics Meetings in Toronto. Cheryl's work is joint with M. Peruggia and T. Van Zandt (Psychology).

**Charalampos** (Babis) **Papachristou** won a Ray Travel Award from the OSU Council of Graduate Students to present his work, "Assessment and application of a nonparametric confidence set approach based on the mean test," at the American Society of Human Genetics 53rd Annual Meeting last fall. Babis' work is joint with S. Lin.

**Shiling Ruan** won a travel award to present her research at the Spring Research Conference at NIST this year. Shiling spoke on "Estimation of Origin-Destination Trip Table Using Link Flow Information from Ground Data and High Resolution Satellite Images," joint work with P. Goel, M. McCord (Civil Engineering) and M. O'Kelly (Center of Mapping).

## Our Student Eat Their Awards!

Two students won spots at round table lunches at the JSM this August.

The ASA Section on Physical and Engineering Sciences awarded Tena Katsaounis a place at the table discussing "Web-based catalogue of designs."

The ASA Section on Physical and Engineering Sciences awarded Cheryl Dingus a place at the table discussing "Using data from customers to improve engineering decisions."

*(continued on page 14)*

## Grad Student Corner
*(continued from page 13)*

### Other Student Activities At The JSM

The department will be well-represented at the Joint Statistics Meetings in Toronto this August. Twelve current students will be presenting their research at the JSM. The students and the titles of their presentations are shown below:

**Haiying Chen**: "Unbalanced Ranked Set Sampling for Estimating a Population Proportion"

**Cheryl Dingus**: "Average Correlations in Projections Designs" (Cheryl also presented this talk at the Spring Research Conference at NIST earlier this year.

**Kristin Duncan**: "Nonparametric and Parametric Bayes Models for Item Response Data"

**Jesse Frey**: "Optimal Distribution-free Confidence Bands for a Continuous CDF"

**Subharup Guha**: "Benchmark Estimation—Theoretical Results and Applications"

**Lori Hoffman**: "Multivariate Statistical Analysis of the NBA"

**Tena Katsaounis**: "A Classification of Two-level Designs"

**Xiaobai Li**: "Estimation of the Finite Population Mean by Judgment Post-stratification"

**Bidisha Mandal**: "Imputing Missing Income Data and Weighting Data with Imputed Income"

**Ofelia Marin**: "An Empirical Comparison of Several Popular Designs for Computer Experiments"

**Cheryl Niermann**: "Fitting Response Time Models by Adaptive Importance Sampling"

**Junfeng Sun**: "Stochastic Models for Compliance Analysis and Applications"

And, in the statistician's version of "Survivor," Jesse Frey will be competing in the ASA Stat Bowl. Stay tuned for next year's newsletter to learn the results of that competition!

### Some Words Of Wisdom From Students After Their First Year In The Department

The incoming class of 2003–2004 has now completed its first year in the program. Several of those students provided some thoughts and advice now that they have made it through year one. Here are their comments:

#### John Draper

This first year has been a great experience. Not only have I greatly furthered my base of knowledge both in statistics and other academic fields, I have made a lot of friends through the department. The support I have garnered through colleagues and professors alike for my extracurricular activities (primarily the OSU Marching Band) has been wonderful. In my first year, I have worked very hard to manage both classes and other activities, but the great people around me have greatly eased this burden and truly made it a joy. Who else can say they completed their first year of graduate school successfully as well as marching in "the best damn band in the land?" I consider myself lucky to have found a program that fits my high academic standards as well as providing avenues for enjoyment. I look forward to the years to come. Go Bucks, and don't forget to look for me on the field on Saturdays!

#### Nidhi Kochar

Leaving home and traveling half way across the globe was not easy but the Ohio State statistics department has been like home away from home. The professors are full of knowledge and wisdom. One never has to think twice before knocking at their door and asking them questions, whether they are academic or just something that has been bothering you. They are always there to help you and guide you in the right direction.

Not only the professors but our wise Patty is there to help you out with everything from registering for courses to answering any queries one may have regarding any official paperwork. And of course there is our lovely Kim who makes you feel right at home by not only baking delicious cookies for us but helping us out in whatever way she can with a warm smile on her face. Last but not least, there is Paul, who has the "keys" to all our problems regarding our offices! Truly, this past year here has been wonderful!!!

#### Colin O'Rourke

The process of personal change is a figurative death and rebirth. As a result of every experience, who one was ceases to exist and someone new takes his place. One can imagine this is not an easy process and involves much discomfort, as I found upon my enrollment in the statistics department. There is much yet to learn and I anticipate more than a few frustrating evenings crouching in a clueless fog over books with dog-eared pages. Yet, when I am most questioning of my judgment, it becomes apparent that tomorrow there will be a new person capable of so much more than the old.

#### Soma Roy

I just want to thank all the staff and faculty of this department for making the transition into graduate school so smooth for me. I think the 'Early Start Program' is a great idea, because it helps you settle down, get to know your classmates and the other people in the department. It is especially nice because fall is usually a difficult quarter and there is little time for anything other than classes and work. Summer is the best time to join the department because the classes scheduled for summer are not very difficult and they help orient you to all that is coming. I really am grateful to everyone for making me feel at home.





## Sports Update

Another season of intramural athletics is now in the record books for the statistics department teams. While the statistics department "athletes" achieved success in the regular season, the playoffs were more of a challenge. The fall season began on an excellent note with the department fielding a volleyball team. The co-ed team went undefeated during the regular season with a 3-0 record. The team of Cheryl Niermann (captain), Sarah Barrett, Jessica Gebler, Danel Draguljic, Kyle Hostetler, Charalampos 'Babis' Papachristou, and Clint Roberts were defeated in a close match of the first round of the championship bracket. The team will look to improve on this year's performance as all members of the team will be back except Barrett.

During winter quarter, John Draper, Brian Ray, Draguljic, and Hostetler joined with some of Ray's friends to form a basketball team. The team went 2-1 in the regular season but lost a nail-biter in the first round of the playoffs by one point. For spring quarter, softball was the sport of choice. Gebler, Niermann, Draguljic, Draper, Hostetler, and Roberts were joined by Elizabeth Cornett, Crystal Dong, Melissa Ludack, Chris Sroka, Adam Weimer, and Dave Wuenschell. When it wasn't raining, the team managed to go 1-1 in the regular season. Finally, the department broke through with a win in the playoffs. However, the success was short-lived as the team lost in the second round. With summer just around the corner, the department will look to build on a successful softball season.

**News Flash**: During the last week in June, a new grad student, unaware of the top national ranking of the faculty golf team, was naive enough to suggest a student-faculty golf match. The match is currently being arranged for the fall, the teams are practicing, and the stakes (one or two hot dogs) are currently under negotiation. For those with long memories, the 2000 student-faculty golf tournament is still a sore point, with both teams claiming victory four years later. Because of the 2000 controversy, both teams will be allowed to give their perspectives on this year's match in the next newsletter!

*Back row (from left to right):*
John Draper, Adam Weimer, Danel Draguljic, Jessica Gebler, Cheryl Niermann
*Front row (from left to right):*
Crystal Dong, Chris Sroka, Elizabeth Cornett, Melissa Ludack, Kyle Hostetler

THE OHIO STATE UNIVERSITY
DEPARTMENT of STATISTICS NEWS

Department of Statistics
The Ohio State University
1958 Neil Avenue
Columbus, OH 43210-1247

06940.011000.61801

Address Service Requested

Non-Profit Org.
U.S. Postage
**PAID**
Columbus, Ohio
Permit No. 711



# CONGRATULATIONS

**To the following students earning degrees in 2003–04!**

## Master of Applied Statistics

**SUMMER 2003**
- Lan Bi
- Juliette Rene Gordon
- Brett Wayne Simpson
- Yan Wang

**AUTUMN 2003**
- Tsuei-Long Chen
- Amy Michelle Copas
- Jing Gao
- Chueh-An Hsieh
- Jia Liao
- Robert Aldridge Mehler
- Abby M. Mroczenski
- Kyle Matthew Porter
- Paul Cameron Walker

**WINTER 2004**
- Yimei He
- Paula Loredana Savu
- Liang Zhao

**SPRING 2004**
- Juan Gao
- Jianping Gao
- Yan Guo
- Shawn Monroe Lavy
- Chunmo Li
- Xia Liu
- Lindsay Caroline Paul
- Jonathan Donn Powell
- Chuang Wang
- Wei Wang
- David Alan Wuenschell
- Lin Yang

## Master of Science

**SUMMER 2003**
- Kevin Patrick Tordoff
- Shuyan Wan
- Yongli Zhang

**AUTUMN 2003**
- Yong Ku Kim
- Chen Quin Lam
- Mark Henry Nemeth
- Ke Wang
- Forrest Jason Westfal

**WINTER 2004**
- Edgar Charles Merkle
- Qingzhao Yu

**SPRING 2004**
- Zhenhuan Cui
- Ralph Jay DeLaubenfels
- Juan Du
- Jesse Conrad Frey
- Yifan Huang
- Hongfei Li
- Xiaobai Li
- Haiyan Xu
- Yan Xu

## Doctorate

**AUTUMN 2003**
- Swati Biswas
- Nicole Kelbick

**WINTER 2004**
- Yuxiao Tang

**SPRING 2004**
- Subharup Guha
- Yufeng Liu
- Qiang Wang



UMC04396