THE OHIO STATE UNIVERSITY

DEPARTMENT of STATISTICS

NEWS

Volume 11, 2003

Remote Sensing in Transportation-Flow

Statistics Faculty Lead National Consortium

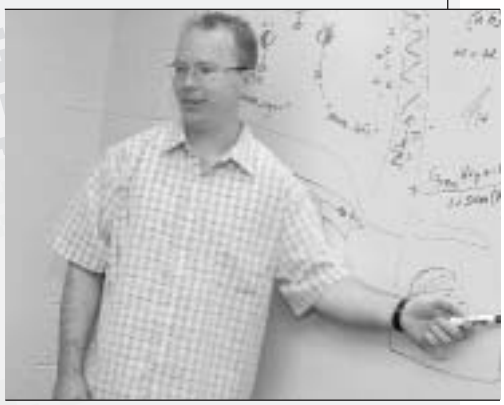
For the last three years, the U.S. Department of Transportation has been funding the National Consortium on Remote Sensing in Transportation-Flow (NCRST-F). This consortium, led by faculty at The Ohio State University, includes researchers at the University of Arizona and George Mason University. At Ohio State, Prem Goel, professor in the Department of Statistics, serves on the interdisciplinary leadership team of the NCRST-F, along with Joel Morrison, director of the Center of Mapping, and two faculty from the Department of Civil and Environmental Engineering and Geodetic Sciences, Carolyn Merry and Mark McCord.

The consortium was awarded to Ohio State, in part due to previous collaborations between Professors Goel, Merry, and McCord, in which they studied the feasibility of combining remote sensed data with ground data for transportation planning applications. In addition, Goel is a co-leader with McCord of a NCRST-F project on combining information from satellite and airborne imagery with ground-based data for improved estimation of two of the most important traffic measures produced by state departments of transportation (DOTs) and other transportation agencies around the world.

The two traffic measures gathered by agencies are average annual daily traffic (AADT) to indicate traffic volumes on a specific highway segment on a typical day of the year, and vehicle miles traveled (VMT) to summarize travel over the entire highway network during a time period. AADT is a critical input in many design, operations, and safety-related decisions. VMT is used to indicate mobility patterns and travel trends and also serves as the basis of federal policy decisions for allocating highway resources.

Present practice involves using continuous traffic recorders on only three percent of all segments on the highway network and requires ground crews to collect two consecutive days of 24 hours traffic volumes on the sample highway segments across the state. To collect these data, the crews must travel extensively to place detectors in

(continued on page 5)



Dan Dougherty (above) discusses a project with participants in the summer MBI program (from left): Pam Cogan and Michelle Lapoczka. Dan is a postdoctoral fellow in the Department of Statistics working with Joe Verducci.

CONTENTS

- Faculty Lead National Consortium
- Update on the Mathematical Biosciences Institute
- Riding the Rails in 2003: A Letter from the Chair
- Supporting the Department of Statistics
- Graduate Student Profile: Gardar Johannesson
- Faculty News
- Statistical Analysis in Disease Gene Mapping
- Departmental Awards
- Send Us Your News!
- Congratulations to Our Graduates
- Alumni News

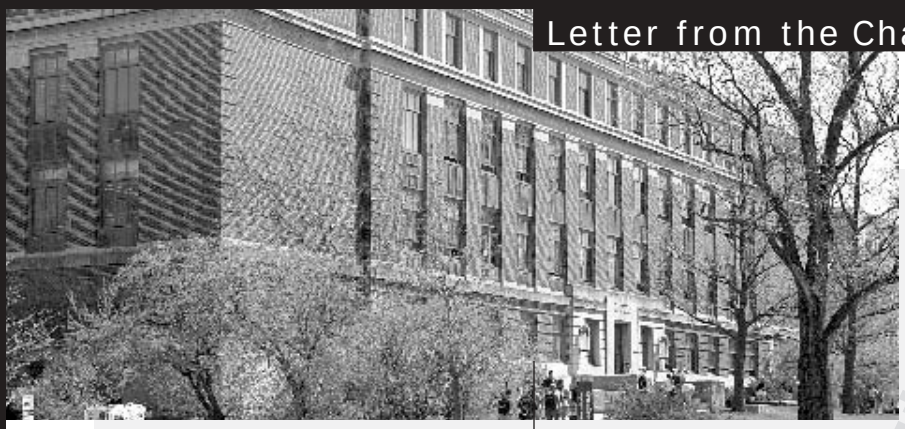
First Year of the

Mathematical Biosciences Institute

The Mathematical Biosciences Institute (MBI) is the first institute in the United States dedicated to bringing together statisticians, mathematicians, and computer scientists with researchers in the life sciences. Funded by the National Science Foundation and Ohio State, the institute opened in the autumn of 2002 with a first-year focus on Mathematical Neuroscience.

The first year drew to a close after a series of six week-long workshops, several tutorials, more than 30 seminars, and a successful summer program. You can learn details about the mathematical, statistical, and computational issues studied by viewing the PowerPoint slides, pdf versions of papers, and even streaming video of workshop presentations that are all available at the MBI web site (http://mbi.osu.edu).

(continued on page 6)



Riding the Rails in 2003: On a Handcar in Ohio

By Doug Wolfe

Doug Wolfe

Our (yours and mine) Department of Statistics' Express is still operating despite the continued poor statewide economic conditions and further budget reductions from the state legislature. At times it seems like we are being forced to continue our journey on a self-propelled handcar—but moving ahead we are, and we shall continue in spite of it all. However, operating a handcar is surely more difficult than simply pointing a diesel in the right direction. If we had to do it alone we would soon tire from the journey—but as always, our department is very fortunate to have such strong support from its faculty, staff, and graduate students. Their efforts keep the energy flowing. Let me update you on the activities and accomplishments of our department over the past year.

Mathematical Biosciences Institute

We have completed the first year of operation for the Mathematical Biosciences Institute, and it was certainly all that had been promised. Direct departmental participation in the institute has been substantial, ranging from Dennis Pearl's work as associate director, the mentoring of postdoctoral researchers by faculty members Xiaotong Shen and Tom Santer, as well as faculty and graduate student participation in the numerous workshops and lectures arranged by the institute throughout the past year. For more details of these activities, see the summary article on page 1.

Personnel Changes

Once again this has been an active year regarding the comings and goings of faculty and staff in the department. First, we were successful in our search for a junior faculty member in the area of spatial/temporal statistics to provide support for our program in Spatial Statistics and Environmental Sciences (SSES). I am pleased to tell you that Kate Calder from Duke University joined our faculty as an assistant professor beginning autumn quarter 2003.

Second, we are sorry that we are losing both our Statistical Computing Scientist Mark Irwin and our Statistical Education Program Specialist Roger Woodard. Mark is assuming a similar position with the biostatistics group at Harvard University, while Roger will become the director of a group of three statistical education specialists with the Department of Statistics at North Carolina State University. We very much appreciate all that Mark and Roger have contributed to the department during their time with us. They will be sorely missed, but we wish them the very best in their new positions. Fortunately, we have been able to hire Jackie Miller as our new statistical education program specialist. Jackie is a one-of-a-kind Ph.D. graduate in statistics education from Ohio State, and she brings a strong history in both the pedagogy and practice of teaching undergraduate statistics courses. We are still searching for a person to fill the statistical computing scientist position.

We are also sorry that Xiaotong Shen has chosen to move from our department to the University of Minnesota, despite our warnings about how cold and desolate northern Minnesota can be in winter. Xiaotong has been a very productive researcher and supportive member of our program, particularly with respect to dissertation direction for our Ph.D. students. We thank Xiaotong for all his contributions to the department and wish him the very best in cold and blustery

Department of Statistics News
Volume 11, 2003

THE OHIO STATE UNIVERSITY

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

Minnesota. We will begin a search for his vacated position in fall quarter.

We have also been fortunate to hire Tom Bishop to teach our statistical consulting courses: Stat 600 and Stat 601, beginning with autumn quarter 2003. Tom is a Ph.D. graduate of our department and brings a wealth of industrial and personal consulting experience to his new position. We are delighted to be adding Tom to our staff in this capacity and we expect his role in the department will grow over the years to come.

Finally, Martha Bainer resigned her staff position in the department to accept a similar position in another part of the university. We are pleased to introduce everyone to Mary Turner who has been hired to fill Martha's vacated position.

Graduate Student Recruitment

The number of graduates of our program showed a substantial increase this past year and they continue to find placement in good positions. The list of this year's graduates can be found on page 15 of this newsletter.

Not to be outdone by her excellent recruitment last year, Graduate Studies Chair Elizabeth Stasny has once again recruited another excellent group of new students to our graduate program. Eighteen students have already begun their graduate work this summer, and another three students will join us in autumn quarter. The combined group of new students includes 12 individuals who were awarded University Fellowships in the university-wide fellowship competition! That is the highest number of enrolling fellowship recipients in recent years.

The names and undergraduate institutions for our 2003–2004 cohort of new graduate students follow.

Brady Brady, U. S. Naval Academy
Valerie Cheadle, University of Rio Grande
Xiaoyi Dong, Ohio Wesleyan University
Danel Draguljic, Millersville University
John Draper, Florida State University
Jessica Gebler, Marquette University
David Kadonsky, University of Wisconsin, Madison
Prasenjit Kapat, Indian Statistical Institute, Calcutta
Nidhi Kochar, University of Delhi
Melissa Ludack, University of Wisconsin, River Falls
Karen McEachrane, Campbellsville College
Sharada Modur, The Ohio State University
Colin O'Rourke, University of New Mexico
Bryan Ray, Muskingum College
Clint Roberts, California Polytechnic Institute
Soma Roy, University of Delhi
Christopher Sroka, Wayne State University
Zhen Wang, Nankai University
Adam Weimer, Michigan State University
Sisi Wu, Peking University
Yihong Zhao, University of California, Riverside

Summer Research Experience for Undergraduates

The Department of Statistics was involved in the summer of 2003 in its third consecutive Research Experience for Undergraduates (REU) Program. The following eight outstanding juniors from across the country participated in the program and conducted research with the noted statistical mentors from the department and their scientific counterparts from across the university community (see box below).

Appeal for Alumni Support

I am taking this opportunity to ask for your help with several department initiatives. You—our alumni—are one of our most valuable resources. In a separate article called "Supporting the Department of Statistics," I describe several efforts of the department that are in danger of being lost due to budget cuts. If you believe that any or all of these projects are worthy of your support, we would very much appreciate it if you would consider making a donation to our Graduate Fellowship Fund #0694-310567. Checks for such a donation should be made out to The Ohio State University, designated for Fund #0694-310567, and sent directly to me at the Department of Statistics, or to the development officer for the College of Mathematical and Physical Sciences, James Azzaro, in the attached envelope. You should certainly feel free to be specific about which of the projects you wish to support.

One More Leg of the Journey

I look forward to another successful year filled with nationally and internationally recognized accomplishments by the faculty, staff, and graduate students in our department. When I return again to this forum, it will be as the departmental diesel (hopefully we will have gotten off the handcar by that time!) pulls into the wheelhouse to bring a new conductor on board!

REU Participant	Statistics Mentor
Leon Buck, University of Wisconsin, Eau Claire	**Mark Berliner**
Stephanie Jones, Rochester Institute of Technology	**Peter Craigmile**
Elizabeth Koehler, Colorado State University	**Tom Santner**
Scott Mollan, Rose-Hulman Institute of Technology	**Elizabeth Stasny**
Jason Rogowski, Gustavus Adolphus College	**Haikady Nagaraja**
Maria Salotti, University of Wisconsin, Stevens Point	**Mario Peruggia**
Abigail Scott, University of Wisconsin, Madison	**Jason Hsu**
Tiffany Swasta, Rochester Institute of Technology	**Prem Goel**

Supporting the Department of Statistics

In the past few years we have significantly increased our recruitment efforts to attract the best international and domestic graduate students to our program. I am pleased to say that we have been increasingly successful. However, to attract such top students to our program and then to provide them with access to other important opportunities during their studies requires the availability of adequate funds.

The recruitment of excellent students has been enhanced in the past by support from our very fine group of Corporate Fellowship sponsors: Battelle Memorial Institute, Lubrizol, Procter and Gamble, and Wyeth-Ayerst. Such support has been vital in attracting the very best domestic applicants to our department for their graduate work and we are appreciative of this valuable corporate assistance. We are, of course, always looking for additional corporate fellowship sponsors. If your place of work might be interested in sponsoring either a Master's or Ph.D. Corporate Fellowship in Statistics with us, please let me know whom to contact. We will be happy to discuss options with them.

We are currently faced with rather severe reductions in internal funding because of increasingly dismal state support of higher education in Ohio. Combined with increased costs, this has placed a good deal of strain on a number of additional areas that affect not only recruitment efforts but also support for student research as well as attendance and participation at professional conferences. In particular, the following five active departmental programs are in danger of being severely curtailed or abandoned because of tight department budgets.

Graduate students participate in a graduation reception hosted by the Department of Statistics.

GRADUATE INFORMATION DAY: This full-day event held early in January each year brings the top prospective domestic applicants to the department to explore the opportunities available in our graduate program. We provide travel and lodging support to enable top applicants to attend. Unfortunately, Graduate School funds to support this event have been drastically reduced for this coming year.

EARLY START PROGRAM: This program provides new students with the option of beginning their graduate study in the summer quarter before the start of their first full academic year in the department. All of the early start students take an introductory course in graduate-level mathematical statistics with an emphasis on important mathematical tools they will need in their first-year courses. In addition, they participate in a teaching course that helps prepare them for their teaching associate duties during the coming academic year. These two courses enable the early start students to more easily make the transition from undergraduate studies in a number of non-statistics disciplines to their common graduate work in statistics, without the additional burden of the commitments of their academic-year teaching or research duties. Graduate School funds to support this program have been completely eliminated as a result of the reduced state funding for higher education.

SHORT-TERM DEPARTMENTAL GRADUATE RESEARCH SUPPORT: We have initiated a new program to provide access for our best graduate students to get involved in research within the first year or two of the start of their graduate studies. Opportunities have been in the form of one- or two-quarter Departmental Graduate Research Associateships awarded by the chair in response to formal joint research proposals from a faculty member and graduate student partnership. Faculty and graduate students alike have enthusiastically received this initiative and we have funded eight such Departmental Graduate Research Associate Awards over the past two years. We would like to expand this program, but cannot do so without an additional source of funds.

TRAVEL TO PROFESSIONAL MEETINGS: The department would like to provide limited funds for every senior graduate student to attend at least one professional conference at which she or he can present their research. This provides an invaluable experience for the graduate students and enables them to expose the rest of our profession to the quality research of the graduate students and faculty in the department.

GRADUATE STUDENT PAPER AWARDS: As graduate students in the department compete successfully for national paper awards, we have decided to provide them with a small monetary reward to recognize their accomplishments. With additional support, these awards could be designated as Alumni Student Paper Awards.

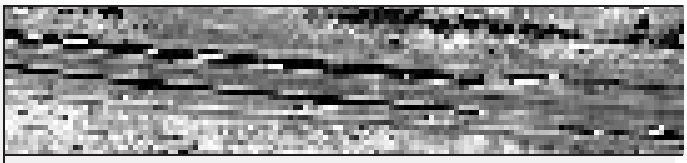
These programs help Ohio State's Department of Statistics stand out as an outstanding department. We hope you will consider a tax deductible gift to the department. Please call me at (614) 292-0293 or the College of Mathematical and Physical Sciences Development Officer James Azzaro at (614) 292-6980 with any questions you may have.

(continued from page 1)

the middle of often heavily traveled highways, disrupting traffic and endangering the crews during detector placement and removal. By using satellites and airborne platforms, the images can cover large areas and access remote highways from safe and non-disruptive off-the-road locations. In addition, by combining information from ground-based data and the imagery, data collection expenses can be reduced drastically.

Traditional ground-based data collection counts vehicles at a point on the highway over much longer time intervals, only at specific sampled segments, whereas the imagery collects "snapshots" of traffic over large areas at an instant of time, on a large number of spatially contiguous highway segments. The two information sources, though complementary in nature, have different levels of noise in equivalent daily counts. Combining these data requires careful modeling and investigation of relative noise levels. The investigators developed procedures to convert the image-based data to information that can be combined with ground-based traffic data when estimating AADT and VMT. They applied their procedures to satellite images and photos from airborne platforms of more than 20 urban and rural interstate segments in Ohio and compared the results to those produced from ground-based data. The differences were small—one standard deviation of the relative errors was under 15 percent. Feeding these results into computer simulations developed for AADT and VMT estimation over large geographic regions, the investigators discovered that combining even a fraction of the data collected from a single satellite with the ground-based data would allow a reduction of more than 50 percent in ground-based sampling efforts while substantially increasing the accuracy in the AADT and VMT estimates.

Applying these procedures on a widespread basis also requires automated image-processing procedures to efficiently extract traffic information from the satellite and airborne imagery. The unique characteristics associated with the imagery require techniques different from those



Satellite image of Interstate 270 used in a data collection.

available for video-based image processing. These investigators have developed Bayesian machine-learning methods to address these issues and demonstrated their promise on a series of IKONOS satellite images and air photos.

As a result of these interdisciplinary activities, the Bureau of Transportation Statistics funded Professors Goel and McCord to develop improved AADT estimation procedures. Their modeling approach shows promise of improved estimation of AADT over the traditional approach, while their performance on large scale networks still need to be investigated.

The investigators are studying the noise characteristics of image data for multiple types of highway facilities, refining their image processing techniques, determining break-even costs, and improving estimation procedures via model-based techniques. Problems in scaling to real networks and implementation strategies will also be investigated.

Personnel: Other team members involved in these projects are Carolyn Merry and Benjamin Coifman, professors from the College of Engineering; and numerous graduate research assistants (GRAs) from the College of Engineering and the Department of Statistics. GRAs from engineering include Parag Goel, Zhuojun Jiang, Gaurav Sharma, and Yongliang Yang. GRAs from statistics include Roger Bilisoly, Patrick Bobbitt, Don Duvall, Gardar Johannesson, Hua Li, Xiang Ling, Changyi Park, Shiling Ruan, and Zhengxiao Wu.

More information about the NCRST-F consortium is available at **www.ncrst.org/research/ncrst-f/ncrst-f_home.html**.

Mathematical Biosciences Institute

(continued from page 1)

Postdoctoral Fellows Work on Ongoing Research Projects

Of the seven postdoctoral fellows working at the MBI in its inaugural year, two worked with statistics mentors Tom Santner and Xiaotong Shen, while Mario Peruggia and other faculty in the department attended MBI workshops and tutorials.

Postdoctoral fellow Dan Dougherty, (Ph.D, 2002, North Carolina State University Department of Statistics) has been working with Xiaotong Shen, Joe Verducci, and Wolfgang Sadee on statistical modeling and inference for applications at the interface of pharmacology and genomics. One project centers on the genetic risk factors of coronary artery disease and their implications for determining the effectiveness of drug therapy. For this project, investigators from the University Medical Center in Pharmacology and Bioinformatics joined with Dan and Xiaotong to form a focused research group, trying to gain a better understanding of small individual differences in DNA called single nucleotide polymorphisms (SNPs) and how they contribute to the risk of coronary artery disease. A second project concerns gene networking, where Dan is currently developing a network-theoretic method for analyzing data from gene microarray studies.

Natural odor signals are most often composed of mixtures of chemicals having different molecular structures. Furthermore, odor mixtures can vary both qualitatively and quantitatively as animals experience different odor objects from the same reward class, such as the fragrance of flowers that present nectar to a honeybee forager. Postdoctoral fellow Geraldine Wright (Ph.D., 1998, in zoology from Oxford; MAS, 2002, from Ohio State) has been working with Brian Smith and Tom Santner to construct a series of experiments that examine what parameters of floral perfumes bees learn and remember while they are foraging. In these experiments, individual worker honeybees are taught to associate floral perfumes (both from real flowers and from artificial scents made in the lab) with food rewards in a classical Pavlovian conditioning paradigm. This classical conditioning is followed by a series of tests that help determine exactly what factors are at the root of how bees distinguish odors. These projects and more will continue into the 2003–2004 emphasis year at the MBI.

Successful Summer Program

The summer program at the Mathematical Biosciences Institute (MBI) at Ohio State brought two teams of high school teachers to campus to study and collaborate with Ohio State faculty and postdoctoral researchers who are part of the institute. The three-week program offered math and science teachers a hands-on awareness of the interconnections between mathematical research and biological research—the mission of the MBI.

Geraldine Wright

Dan Dougherty led one of the research groups during the summer program with teachers Michelle Lapoczka and Pam Cogan from Harrison Central High School in Cadiz, Ohio. They worked on a project that modeled a neural control system to allow an insect to successfully navigate through a maze. Mike Smith and Matthew Wallschlaeger from Big Walnut High School in Columbus worked on a project with Geraldine Wright modeling how the olfactory system functions, working to understand how odors are represented in the brain.

2003–2004 Emphasis Year on Cellular Processes

This year, the MBI will examine cellular processes. In fall quarter the program will focus on cell growth, division, and death, with special attention to the role of cell proliferation in cancer growth and therapy. Winter quarter topics will focus on the mathematical and statistical study of how cells respond to their environment and coordinate their behaviors with that of other cells. Finally, spring quarter programs will feature a focus on host immune intracellular dynamics and then track the interactions of the immune cells in their environment as they interact with viral, bacterial, and parasitic pathogens.

Mike Smith (left) and Matthew Wallschlaeger discuss their project during the summer MBI program.

Graduate Student Profile:

Gardar Johannesson

When I was finishing my B.S. in math from the University of Iceland, I had no clear plans for the future. My interests were in the natural sciences, where I knew a strong math background would always be useful. I was therefore thankful when a former Ohio State statistics graduate, Dr. Stefansson, a student of Dr. Hsu, offered me a job that combined both at the Marine Research Institute in Iceland. It was there that I got my first real exposure to statistics and its various applications. Three years later I was on my way to The Ohio State University to begin graduate school in the Department of Statistics.

I came to Ohio State in early summer, thanks to the generous Early Start program that the department offered to new students. Taking advantage of this offer was a wise thing, as it allowed me to adjust to living in Columbus and brush up on my statistics and math background before the busy fall. However, one thing it didn't prepare me for was a warm and humid Columbus summer. I still remember my first class at Ohio State, which was a disaster. It was over 90 degrees Fahrenheit outside that day and, as I was coming from Iceland, where a "hot" summer day is in the upper 60s, the clothes that I was wearing were—let's just say, very "improper." I remember sitting there and sweating, and asking myself, "What the heck am I doing here?" I survived that summer and even learned to enjoy summers in Columbus.

My first three years at Ohio State were spent taking numerous classes and working as a teaching/research assistant. I was impressed by the large variety of courses offered in the department, which is definitely one of the many benefits of studying at a large statistics department. I urge new students to take advantage of this. Close to the end of my second year I was so fortunate to be offered a research assistant position by Dr. Goel, and I'm thankful to him for that opportunity.

At the end of my third year, I decided to head back to Iceland. I had the opportunity to be involved in new and exciting research in genetics while working on my Ph.D. However, this combination wasn't everything that I expected, and, at the same time, exciting news arrived from Ohio State about the newly established Program in Spatial Statistics and Environmental Sciences (SSES), headed by Dr. Cressie.

For the past three to four years, I have been a research assistant and a student of Dr. Cressie's My research assistant work has both been directly linked to my thesis work and also various other research projects associated with the SSES Program. This has given me invaluable experience that I can draw upon in the future, and I thank Dr. Cressie for this unique opportunity.

My dissertation work is in multi-resolution spatial and space-time statistical modeling with application to remotely sensed environmental data. With advances in remote-sensing technology, scientists are faced with challenges in processing and drawing conclusions from massive, global, space-time environmental datasets. A promising approach is to model the data at multiple spatial resolutions, with each resolution capturing the variation in the data not visible at the coarser resolutions preceding it.

I look forward to facing challenges at a new job, but also find it hard to leave Columbus, which has become my home away from home. I have met and worked with wonderful people while in Columbus, many of whom have become good friends. I expect to visit Columbus on a regular basis in the future, meeting friends, collaborating on research, and, of course, enjoying "gourmet" lunches on High Street.

Graduate students pose for a photo with C.R. Rao before the 2003 Rustagi Lecture.

Faculty News

Noel Cressie

This year **Noel Cressie**, professor of statistics and director of the Program in Spatial Statistics and Environmental Sciences (SSES), was honored as the J. Stuart Hunter Lecturer, 2002 by the International Environmetrics Society.

Greg Allenby, professor of marketing with a joint appointment in statistics, and **Dennis Pearl**, professor of statistics, both became Fellows of the American Statistical Association, bringing the department total to 14. Pearl has also been instrumental in creating and managing the Statistics Buffet project (featured in last year's newsletter). The project was named a finalist in the Computer World honors program as one of the top seven (worldwide) uses of technology in education. For more information on the project refer to **www.stat.ohio-state.edu/news/newsletters/statnews2002.pdf**. As if those weren't enough, Pearl also serves as associate director of the Mathematical Biosciences Institute and the director of CAUSE, the Consortium for the Advancement of Undergraduate Statistics Education.

Dennis Pearl

More faculty doing more great things: The paper "On Combining Recursive Partitioning and Simulated Annealing to Detect Groups of Biologically Active Compounds" by **Paul Blower, Michael Fligner, Joseph Verducci, and Jeffrey Bjoraker** has been selected for the 2003 Statistics in Chemistry Award by the American Statistical Association's Statistics in Chemistry Award Committee.

Omer Ozturk was promoted to associate professor at the Marion campus.

Participation in the ASA: **Tom Santner** is chair elect of the governing board of the ASA committee on sections, **Angela Dean** is program chair elect of the section on physical and engineering sciences of ASA, and **Mario Peruggia** is chair elect of the section on statistical graphics of ASA.

Joe Verducci (left) and Mike Fligner have some fun with chemistry and statistics.

Welcome new faculty!

Ohio State alumna **Jackie Miller** joins the department as our program specialist, replacing **Roger Woodard**, who has taken a position at North Carolina State as a clinical assistant professor. Jackie spent the three years since her graduation as an assistant professor at Drury University. Last year **Yoon Lee** from the University of Wisconsin joined the faculty as a new assistant professor, and this year **Catherine Calder** from Duke University joined the department. Ohio State alumnus **Tom Bishop**, who has been running a private consulting company in Columbus, joined the faculty part time. He will be teaching the Statistical Consulting courses as well as some of our applied courses. Biographical sketches of our four newest faculty members follow. In their own words:

Yoon Lee

Yoon Lee

In 2002 I graduated from University of Wisconsin at Madison. For those who have never been there, Madison is a cozy and pretty town with two beautiful lakes. It has been like a hometown to me since I came to the United States for graduate study. I am originally from South Korea, where I received B.S. and M.S. in statistics at Seoul National University. In the beginning of my graduate study, I served as a teaching assistant for a few courses. Later, I started working with my academic advisor, Professor Grace Wahba, as a research assistant. It was very enjoyable to work under her guidance, and I am grateful for having many wonderful opportunities in statistical research.

My dissertation regards a modern classification method known as the

Support Vector Machine. My advisor and I, together with Professor Yi Lin, shed a statistical light on the method, and proposed a new extension to the multiclass case in a principled way. This extended method was applied to cancer classification using microarray data and also to cloud classification using satellite radiance profiles. In line with the previous work, my interests lie in both methodological research and applications. I believe that statistical methods can offer the best solutions for scientific problems that feature a vast amount of data and complex underlying mechanisms. Problems in bioinformatics or genomic research, for example, may require either novel approaches or profound modification of existing methods. This kind of challenge is always fascinating to me.

About a year has passed since I joined the statistics department in Columbus. I would like to thank many people in the department for their hospitality. Without their help, it would have been much harder for me to settle into the new environment.

Catherine Calder

I finished my graduate studies at the Institute of Statistics and Decision Sciences at Duke University in Durham, N.C. My statistical interests include Bayesian statistics, spatial and spatial temporal modeling, and statistical computing. I enjoy participating in interdisciplinary research, especially in the areas of environmental science, biology, and ecology.

Catherine Calder

My dissertation research focused on extending the process convolution approach to modeling spatial processes to incorporate a temporal component. I have applied this new class of space-time models to air pollution data. In addition to my graduate work in statistics, I participated in ecological research at Duke's Center on Global Change. In this interdisciplinary group, I worked with ecologists and computer scientists to develop a complex computer model to simulate forest dynamics.

I was born and raised in Evanston, Ill., and remained in the Chicago area for my undergraduate education. In 1999, I received a B.A. in mathematics from Northwestern University. My desire to work on applied problems convinced me to pursue a graduate degree in statistics.

On a personal note, I am married to Chris Holloman, who is currently working with the Statistics and Data Analysis Systems group at Battelle. We have been living in the Columbus area for a couple of months now and are finally readjusting to the cold weather after three years of living in the South.

I am happy to have joined the Ohio State Department of Statistics and the Program in Spatial Statistics and Environmental Sciences.

Jackie Miller

Jackie Miller

Some of you may recall that I graduated from The Ohio State University in June 2000 with a one-of-a-kind Ph.D. in statistics education. At that time, I was very close to remaining at Ohio State in a newly created auxiliary assistant professor and program specialist position. However, I felt that I needed to be out on my own for a while, and I had always wanted a tenure track position at a small liberal arts school.

For the past three years, I have been an assistant professor at Drury University in Springfield, Mo. During that time I have developed an actuarial sciences minor and planned several statistics courses which may be offered in the future if the statistics minors I worked on are officially approved. Being in a liberal arts environment was a wonderful thing for me—the relationships with students and colleagues across the campus were great. I will miss (in no particular order) my advisees, some students with whom I became close, many colleagues, and even several administrators (!) One of my department colleagues (in concert with a couple of my advisees) threatened to shackle me in my office, letting me out only to teach (and to shower, I would hope!). I was told that Samantha and Maggie (my dogs) would be allowed to live in my office with me. Many people were upset with my leaving, but they are all supportive of my move (except for those schemers…). So what lured me away from such an excellent position?

The auxiliary assistant professor and program specialist position which was started the year I graduated was available again, the department offered me the position, and I was ready to return home. Columbus has a lot more to offer me personally than Springfield does. Plus, I feel that I have more professional development opportunities at Ohio State. An extra bonus is that I am closer to my family and back in the same city with some of my close friends.

I am heavily involved in the statistics education community, as statistics education is my area of interest. As a member of the Research Advisory Board and an associate editor of online resources for the Consortium for the Advancement of Undergraduate Statistics Education (CAUSE), I believe I will be able to contribute more to the cause (pun intended) while working at the host institution (Ohio State) than I could from there. Not only do I participate in CAUSE, but I am a member of the Executive Committee for the Section on Statistical Education for the American Statistical Association. I participated in the Isolated Statisticians

(continued on page 10)

Faculty News
(continued from page 9)

Group (I'm hoping they'll keep me even though I won't be isolated any more!) and grade AP Statistics exams annually. I have a collaborative research plan with Joy Jordan (Lawrence University) that will examine how the Writing-Across-the-Curriculum movement can be used to inform statistics education, beginning with projects in introductory statistics courses. I also look forward to working with Dennis Pearl and Deb Rumsey on other issues in statistics education.

On a more personal note, after major back surgery in July 2002, I have begun lifting weights at the gym and rowing on my rowing machine at home. I will hopefully get back on the water in Columbus! Getting back into shape feels wonderful! I have also kept up with my timpani playing through a couple of community orchestras here in Springfield.

Anyway, I am thrilled to return to the department after a three-year absence. I look forward to all that my position affords, from teaching courses to working with the TAs to working on the undergraduate offerings in the department.

Tom Bishop

I am returning to teach at the Ohio State University after many years in the private sector. I obtained my Ph.D. in Statistics from Ohio State in 1976. After completing my degree I joined the faculty in the Department of Statistics at Virginia Polytechnic Institute and State University in Blacksburg, Virginia. After two years, I returned to Columbus and joined the Nuclear Engineering Department at the Battelle Memorial Institute. During my first year at Battelle another Ohio State graduate, Bert Price, was hired by Battelle to start a statistical consulting group. Bert asked me to join him, and so I left the Nuclear Engineering Department and began to develop an internal consulting practice with Bert. I concentrated on engineering and physical science research projects. Over the years at Battelle I was fortunate to become involved in a wide range of statistical consulting projects. These projects dealt with a variety of areas including: environmental science; chemistry; pharmaceutical drug testing; metallurgy and material testing; automotive testing and application of statistical process control theory in manufacturing environments.

My experience in the application of statistical process control theory in manufacturing environments led me to the belief that similar applications existed in service industries, such as banking, insurance, and health care. In 1987 I left Battelle and started an independent statistical consulting firm, Bishop & Associates, Inc. Our firm provides statistical consulting and training services to a number of clients in both manufacturing and service organizations who are developing and implementing performance management and statistical process control systems. We have developed a performance improvement implementation strategy based on the pioneering work of Walter A. Shewhart and W. Edwards Deming. This strategy is based on a performance improvement team concept and a rigorous process analysis protocol. An integral part of the protocol involves the in-depth statistical analysis of the cause systems of variation affecting key productivity and quality indicators.

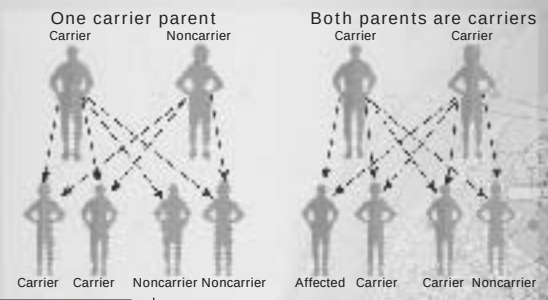
Tom Bishop

I teach numerous short courses on performance management theory, team leadership, statistical methods, statistical process control, cost of quality analysis, measurement system evaluation techniques, and the design and analysis of business and industrial experiments.

I co-authored the graduate level text *Experimental Design and Analysis*, with Marvin Lentner from Virginia Tech, and I have recently completed a new book on the application of the Shewhart and Deming performance optimization theory to manufacturing, service and administrative processes entitled *Managing the Hidden Employees*. This book will be used in the Stat 600 and 601 courses.

I live in Worthington with my wife Vicki, and we have two grown daughters, Amanda and Megan. I am looking forward to returning to teaching at Ohio State and working with the students and faculty in the Department of Statistics.

Students enjoy a reception in the Math Tower.



Dr. Shili Lin

Statistical Analysis in Disease Gene Mapping

For the past three years, the College of Mathematical and Physical Sciences has produced an academic year calendar that is distributed to high school science teachers across the state of Ohio. Last year, one of the feature stories showcased Shili Lin's research in statistical genetics:

Within every cell of our body lies the blueprint for creating new cells. The genes found in your chromosomes, stored in DNA, determine each trait that you have – from the color of your eyes to the shape of your earlobe. Some diseases are caused by genetic abnormalities passed along from one generation to another. The massive amounts of data currently being produced in projects such as the human genome may offer us the opportunity to determine the exact gene involved in the disease. Many challenges exist, however.

Statistical analysis of large complex data systems combines the expertise of statisticians working together with a variety of other scientists – from clinical psychologists to veterinary scientists. Dr. Shili Lin, a professor of statistics at Ohio State, gets excited about disease mapping.

"Without statistics and statistical modeling, we would not be capable of understanding who introduced the disease genes," she said. But thanks to statistics, scientists can analyze genetic data on complex family trees such as the Hutterite Pedigree. It offers clues to scientists who are trying to determine which gene is the culprit in disease. You might think of "pedigree" in relation to expensive, registered dogs whose lines are acknowledged by the American Kennel Club or other breeding association.

"And it is very similar," said Lin. She is currently working on a problem with scientists at Florida State University to determine the source of a problem common to some show dogs. "There is often a serious health problem that will develop due to in-breeding," she said. Another challenge is that different mutations can create the same symptoms, making determination of the source particularly difficult.

As researchers in these fields continue to work together, statisticians will no doubt create new methods of mathematical modeling to find the solutions to these complex problems. (At Ohio State, the Mathematical Biosciences Institute will offer opportunities for statisticians, mathematicians, and researchers in all the life sciences to work together to form better methods of data analysis.)

For more information about the statistical genetics program in the Department of Statistics at Ohio State, see: www.stat.ohio-state.edu/~statgen.

Congratulations to our Award Winners!

Departmental Awards

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 2002–03, the awards for best TAs were presented to Amy Copas, Kristin Duncan, and Marian Frazier. Each of these TAs made an outstanding contribution to the teaching mission of the department. The faculty award was shared between Professor Douglas Critchlow and Professor Elizabeth Stasny.

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 2002–03, the winner of the best consultant in the Statistical Consulting Service was shared between Haiying Chen and Swati Biswas. The award for the best research associate was presented to Tao Wang. The award for best research leading to the Ph.D. was presented to Gardar Johannesson. We congratulate these people and thank them for their hard work.

CRAIG COOLEY MEMORIAL PRIZE

The Craig Cooley Memorial Prize for 2002–03 was awarded to Kristin Duncan. 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 page 14 for the fund number.

UNIVERSITY FELLOWSHIPS

Single year University Fellowships were awarded to Sumayyah Abdullah, Juliette Gordon, Hongfiei Li, and Yan Xu. In addition, Graduate Enrichment Fellowships were awarded to Derrick Barbee and Bahati Lett.

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 2002–03 student recipients are as follows:

Lubrizol Foundation Fellowship

An award in the amount of $3,000 is provided by the Lubrizol Foundation. The 2002–03 recipient was Kyle Porter from Mount Vernon Nazarene University.

Wyeth-Ayerst Fellowship

An award in the amount of $3,000 is provided by Wyeth-Ayerst. The 2002–03 recipient was Amy Copas from the University of Pittsburgh.

We appreciate all the past support from the Lubrizol Foundation, Battelle and Wyeth-Ayerst.

CHAIR FELLOWSHIPS

Single year awards in the amount of $1000–$1500 are provided through the department as chair fellowships. The 2002–03 recipients were incoming students Sumayyah Abdullah, Derrick Barbee, Sarah Barrett, Laura Gillenwater, Juliette Gordon, Bahati Lett, and Kimberly Walters.

THREE STUDENTS WRITE NATIONAL AWARD-WINNING PAPERS

Our students continue to make a mark for Ohio State at the Joint Statistical Meetings. This year three students are winners of ASA student paper competitions and presented their papers during the Joint Statistical Meetings in San Francisco in August.

Jessica Kohlschmidt and Xiang Ling are winners in the student paper competition sponsored by the ASA's Government Statistics Section, Social Statistics Section, and Section on Survey Research Methods. Jessica's paper is titled, "Handling Missing Data: Union Formation Issues and Those Lost to Follow-Up." Xiang's paper is titled, "Missing Data Imputation and a Hierarchical Approach for the Change of Support Problem in the Buckeye State Poll." Both were supported to do this research through graduate student summer research awards from the OSU Center for Survey Research and College of Social and Behavioral Sciences.

Yufeng Liu is a winner of the student paper competition for the ASA Statistical Computing and Graphics Sections. Yufeng's paper is titled "Multicategory Support Vector Machine and Psi-Learning."

OTHER STUDENT PRESENTATIONS AT THE JSM

In all there were 12 presentations at the Joint Statistics Meetings this year by Ohio State students (counting two students who graduated in December 2002). In addition to the three listed above, the following students represented Ohio State at the meetings.

Swati Biswas: "An Approach for Analyzing Linkage Data that Accounts for Variable Levels of Heterogeneity"

Kristin A. Duncan: "Bayesian Cross-Validation: A Comparison of Estimators"

Marilisa Gibellato: "Stochastic Modeling of Sleep Duration Data"

Subharup Guha: "Effective MCMC for Over-Dispersed Models"

Tena Katsaounis: "Association Measures of Binary Arrays"

Yuqun Luo: "Finding Starting Points for MCMC Analysis of Genetic Data from Large and Complex Pedigrees"

Sumithra J. Mandrekar and Jayawant N. Mandrekar: "Are Our Data Symmetric?"

Martina Pavlicova: "Making the T-test Relevant to fMRI Data" (Martina's travel was supported in part by a travel grant from the OSU Council of Graduate Students.)

Yuxiao Tang: "Estimating Correlation in a Longitudinal Study with Missing Data"

STUDENT TRAVEL AWARD WINNERS

Our students continue to win awards to travel to many other conferences to present their work.

Swati Biswas: "Linkage analysis of the simulated data - Evaluations and comparisons of methods," Genetic Analysis Workshop 13, Nov. 2002 (joint work with fellow student Charalampos Papachristou).

Swati Biswas: "An alternative approach to the A-test for estimating linkage parameters in the presence of heterogeneity," International Genetic Epidemiology Society Meeting, Nov. 2002.

(continued on page 14)

Send Us Your News!

Please complete this form for our files and return to:

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

or reply by e-mail to fligner.1@osu.edu

Alumni Reply Form

Name _____

Home Address _____

City _____ State _____ Zip _____

Home Phone _____ Degree(s) and year(s) _____

Current Professional Title _____

Institution/Company _____

Business Address _____

City _____ State _____ Zip _____

Business Phone _____ Fax Number _____

E-mail Address _____

Personal and/or Professional News
Please share some information about yourself with us. Unless you request otherwise, we will assume it may be mentioned in future newsletters.

_____

_____

_____

(continued on page 14)

Departmental Awards

(continued from page 13)

Swati Biswas also was selected to present her dissertation research in the Hayes Research Forum of Ohio State.

Kristin Duncan: "Bayesian Cross-Validation: A Comparison of Estimators" at the 2003 Spring Research Conference in Dayton.

Tena Katsaounis: "Information Matrices of Irregular Factorial Designs" at the Conference in New Directions for Experimental Design in Chicago in May 2003.

Yufeng Liu: "Multicategory Support Vector Machine and Psi-Learning" at the Conference on Machine Learning, Statistics, and Discovery, June 22–26 in Utah.

Martina Pavlicova: Human brain mapping organization: Travel Fellow Award - $500 to go to HBM2003.

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 funds in the Department of Statistics. 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 # 06940–605898

Whitney Scholarship - Awards for consulting and research for graduate students - Fund # 06940–607689

Rustagi Memorial Lecture - Fund # 06940–606245

Statistics Support Fund - Includes support for visiting colloquium speakers, conference travel awards for graduate students, and the Craig Cooley Memorial Award – Fund # 06940–307669

Statistics Graduate Fellowship Fund - Graduate Fellowship awards given by the Department of Statistics - Fund # 06940–310567

Alumni Reply Form (continued)

Comments about the Newsletter

CONGRATULATIONS

To the following students earning degrees in 2002–03!

Master of Applied Statistics

SUMMER 2002	Shaozhen Zhou
AUTUMN 2002	Xueliang Pan Liping Song
WINTER 2003	Ying Luo Lei Rong Desheng Sun Xuan Yang Feifei Ye
SPRING 2003	Kevin Brucker Ellen Mecklenburg Haoying Ou Gary Phillips Matthew Snow Rong Xu

Master of Science

SUMMER 2002	Yanfei Atwell Haiying Chen Hui Chen Yufeng Ding Agatha Henry-Mabry Xun Hu Hua Li Xiang Ling Junfeng Sun
AUTUMN 2002	Cuiwei Chai Shengjun Liu Wei Zhao
WINTER 2003	Jian Zhang
SPRING 2003	Jessica Kohlschmidt Yan Li Bidisha Mandal Cheryl Niermann Youlan Rao Zhongmei Su Yiping Sun Zhengxiao Wu Yongmei Zhou

Doctorate

SUMMER 2002	Pankaj Choudhary Jeffrey Lehman
AUTUMN 2002	Yuqun Luo Zachary Skrivanek
SPRING 2003	Gardar Johannesson Yonggang Zhao

ALUMNI NEWS

Compiled by Mike Fligner

Note from Mike: Alumni, you need to complete the Alumni Reply Form or e-mail me since that's the way to keep this column going!! I've also been known to call people at all hours for their entries and personal anecdotes, so make it easy on yourselves and cooperate . . .

Tommy Wright (Ph.D., 1977): Who learned to count rather well and without error before the age of six, but now finds himself among several thousand others who get paid to think about how to count a nation's population to keep its democracy going? Since second grade, Tommy wanted to teach mathematics. With an M.S. in mathematics and being the youngest on the mathematics faculty at a small college in Tennessee, he was the one asked (ordered) to teach the course in probability and statistics when his colleagues declined. Having no background in probability and statistics, he tried to stay a few pages ahead of what he was teaching. But as he taught, he learned much. While statistics was not as clean and beautiful as mathematics (concepts, definitions, axioms, theorems, corollaries ...), he saw that statistics had many applications to everyday matters and that it could be theoretical. He also saw that he could teach statistics in many departments, including mathematics. At about the time he was contemplating returning to study for the Ph.D., he took some undergraduate students to visit Ohio State. By chance, he met Professor Ransom Whitney who encouraged him to think about graduate study in statistics at Ohio State. He was quite impressed and honored to have met the Whitney of the "Mann-Whitney Test," which he had just taught a few weeks earlier. He and his wife had their first child on June 30, 1973. That fall, he began to study at Ohio State where he developed an interest in probability sampling and completed his dissertation ("Bayes Allocation and Sequential Estimation in Stratified Population") in 1977 under the direction of Professor Jagdish Rustagi.

That fall, he left Ohio State to teach mathematics at Knoxville College (Tennessee) and became department chair one year later. He also taught one course in statistics at the nearby University of Tennessee. In 1979, he joined the research staff in the Mathematical Sciences Section of Oak Ridge National Laboratory, where he did applied research and consulted on numerous sampling related projects in many areas including: energy, environment, and transportation. He continued to teach part time at the college and the university. In 1980, he worked with scientists and developed Bayesian models for computing the probability of missing hot spots, areas with high levels of radioactivity at formerly used nuclear weapons research sites that had been cleaned up and were near being decommissioned. As an invited discussant at the 1980 Census Undercount Conference, he shared ideas from this work on missing hot spots and suggested that they might have some application with the Census Bureau's continuing problem of missing folks in the decennial census. His research areas of interest include probability sampling, design of sample surveys, sampling with probability proportional to size, exact estimation methods, applied probability, and elementary combinatorics. He likes trying to communicate statistical concepts to general audiences and trying to find simple proofs for big results. He is most proud of a two-page paper (1992) in The American Statistician which uses Lagrange's Identity to provide a very simple proof that Pearson's correlation coefficient is between -1 and +1 and reveals its connection with the straight line. Following an ASA/NSF/Census Research Fellowship where he worked on the use of probability sampling to improve counting in the decennial census, he joined the U.S. Bureau of the Census in 1996 as chief of the Statistical Research Division, which has a research staff of about 75

(continued on page 16)

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

Alumni News

(continued from page 15)

in mathematical statistics, computing, and the social and behavioral sciences. He became an elected member of the International Statistical Institute (1989) and was selected a fellow of the American Statistical Association (1995). Tommy and his wife Marsha have three adult children (one daughter and two sons). He can be reached at twright@census.gov.

Brian Williams (Ph.D., 2000) married Aparna Huzurbazar on March 7, 2003. Aparna is a professor of statistics at the University of New Mexico in Albuquerque (a colleague of **Laura Salter (Ph.D., 1999)** and **Justin Kubatko (M.A.S., 1998)**. Brian is completing three years as an associate statistician at the RAND Corporation in Santa Monica, Calif. At RAND, Brian had the opportunity to work on many interesting statistical applications in both military and health care policy research. He has recently completed a book, *The Design and Analysis of Computer Experiments* (with **Tom Santner** and **Bill Notz**, both in the department). In September, Brian joined the Statistical Sciences Group at Los Alamos National Laboratory (LANL) in Los Alamos, N.M. He is excited at the prospect of continuing his research efforts in computational statistics and statistical evaluation of complex computer models and becoming involved in other areas of active statistical research at LANL. Brian and Aparna plan to make their home in Santa Fe, N.M. They are currently busy with their move and are looking forward to enjoying the New Mexico outdoors.

Dave Cameron (M.A.S., 1987) is senior director of Data Solutions for Merkle Direct Marketing in Lanham, Md. Dave is responsible for the statistical studies and data centering around all the information the direct marketers know about you! Merkle was recently ranked by an independent survey organization as the #1 database marketing company in America. Database marketers use statistics to predict consumer response to marketing initiatives. Under Dave's leadership, the statistical group has grown from two people to 15 (including four graduates from Ohio State's graduate statistics program). Dave is happily married to his wife, Joanne, of 17 years. They have two children, Sylvia (age 7), and Ian (age 1). Dave can be reached at dcameron@merklenet.com.

Peggy Hwang (Ph.D., 1997) Since graduation, Peggy has worked in some very different fields in the metropolitan Washington, D.C., area. She tried out database marketing for a while, followed by a few years in a statistical consulting firm that frequently dealt with litigation data because the president of the firm often served as a statistical expert in various legal matters. Currently, Peggy is the biostatistician of a small CRO that specializes in cardiovascular research studies. Contact Peggy at peggyh@c2r.net.

Chris Bush (Ph.D., 1997) has been working at Novartis Pharmaceuticals in New Jersey since 1997. Since joining Novartis he has worked as the statistician primarily responsible for medications to prevent transplanted organ rejection, as well as products for dermatology and diabetes. Chris is the lead statistician on a new compound in transplantation that has recently started Phase 3 trials. His wife, Wandy, when not busy decorating cakes, has been extremely busy driving their two children, Cassandra (12) and Jordan (10), to various activities. For the past year they have lived in Basel, Switzerland as part of a work rotation for Novartis. Novartis now employs at least three Ohio State grads (**Ming Zheng** and **James Pan**) and is looking forward to hiring more Buckeyes! You can reach Chris at christopher.bush@pharma.novartis.com.

UMC03610