



News & Notes from Sitterson Hall

Issue Sixteen, Fall 1995

Department of Computer Science
The University of North Carolina at Chapel Hill

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Chairman's corner

This fall marks my 25th anniversary with the Department: a quarter century! When I arrived in August 1970 we were a faculty of eight housed in a 100+ year-old building with no computers. Things certainly have changed!

The big news this fall is that **Frederick P. Brooks, Jr.**, Kenan professor, has won the 1995 Bower Award and Prize in Science. The award recognizes his achievements in computer science and computer science education. Congratulations, Fred! There's more information about the award in the "Congratulations to . . ." section.

Since our last newsletter, we have welcomed three new faculty members: **Ming C. Lin**, adjunct assistant professor; **Timothy L. Quigg**, associate chairman for administration; and **Mary Whitton**, research assistant professor. You will find more about them in this issue.

Peter Calingaert's retirement in May created a vacant faculty position. Peter, of course, is irreplaceable, but we will be recruiting this spring for someone in hardware to fill that position.

Thanks to the hard work of **Jim Anderson**, assistant professor, and generous support from the U.S. Army Research Office, the computer science departments at UNC-Chapel Hill, Duke, and NC State have formed the Triangle CS Distinguished Lecturer Series. See this issue for more details.

In our last issue we reported the sudden death on 3 April of a longtime staff member, **Belmon Dean, Jr.**, who had served as an electronics technician since 1983. On 27 July, the Computer Services staff held a special celebration to share special memories of him. Many Department members attended as well as several members of Belmon's family, including his widow Lena Dean, his grandson Belmon Dean IV with his mother Cherri Riggsbee, and his granddaughters Patrice Scott and Genelle Dean. We have placed a plaque in his honor in the Electronics Shop.

J. Carlyle Sitterson, for whom our building was named, passed away on 19 May after a lengthy illness. He was 84. Sitterson served as dean of the College of Arts and Sciences from 1955 to 1965 and as chancellor from 1966 to 1971. Our new building was named for him in 1986 in recognition of his University service.

I am delighted to report that **Mark Moir** is the 1995- 96 recipient of the Computer Science Alumni Fellowship. Mark's work is described in the "Research Highlights" section. Generous contributions from our alumni and friends make this fellowship possible. We appreciate your contributions and welcome your continued support. This is especially important to us at this time of declining State support for students. I have enclosed a donation card and envelope as a subtle reminder!

We have a new Chancellor: **Dr. Michael Hooker**, a 1969 graduate of UNC-Chapel Hill, has returned to lead us through what may be some difficult times. It was very encouraging to hear at his installation ceremony on University Day, 12 October, that he is a strong supporter both of graduate education at UNC-Chapel Hill and of information technology. He emphasized the significant contributions that our top-notch graduate students have made to critical research programs, which ultimately impact on the citizens of North Carolina, the nation, and the world.

As always, we enjoy hearing from you. We encourage you to send items of interest to our editors for future issues. Please stop by to see us whenever you are in town.

Steve Weiss

Welcome!

New appointments

Ming C. Lin was appointed as adjunct assistant professor in June. She earned a B.S. (1988), an M.S. (1991), and a Ph.D. (1993) from the University of California-Berkeley. Her research areas are physically- based and geometric modeling; applied computational geometry; robotics; distributed interactive simulation; virtual environments; and algorithm animation. She is the program manager of discrete mathematics and computer science at the U.S. Army Research Office in Research Triangle Park, N.C.

Timothy L. Quigg was appointed as lecturer and associate chairman for administration in July. Prior to joining us, he spent five years as senior contract specialist and negotiator for UNC-Chapel Hill's Department of Contracts and Grants, where he represented the University in all of its contract negotiations with federal agencies; managed all institutional research administration activities for all federally funded projects; and handled all of the international projects for various departments. Tim received his masters in Public Administration, with concentrations in research and analysis, from NC State in 1979. He has an extensive background in human services needs assessment, planning, and resource allocation.

Mary C. Whitton was appointed as a research assistant professor in May. She earned a B.A. in 1970 from Duke, an M.S. in Guidance and Personnel Services in 1974 from NC State, and an M.S. in Electrical and Computer Engineering in 1984 from NC State. She has been with us since fall 1994 as a visiting scholar. Mary is the project manager for virtual environments research. Her research areas are virtual and augmented reality systems for data visualization; head-mounted displays; and computer graphics system architecture.

Visiting faculty

William Dally, visiting associate professor, is working with graphics and Microelectronic Systems Lab (MSL) faculty from August 1995 to June 1996. He is on sabbatical from the Massachusetts Institute of Technology (MIT) where he is associate professor of electrical engineering and computer science. At MIT, Bill leads a research group that builds experimental parallel computers. He teaches courses on subjects ranging from circuit design to operating systems. During his stay here he plans to investigate architectures for image-based (rather than polygon-based) graphics systems.

Hilbert Levitz, visiting scholar, is working with David Plaisted, professor, during fall 1995. He is on leave from Florida State University where he is a professor of computer science. He is a logician and has written on recursive function theory, and applications of transfinite ordinal numbers to proof theory.

New students, fall 1995

Amaury Alvarez, Sumedh Barde, Alexandra Bokinsky, Hai-Liang Cai, Dulcinea Carvalho, Jun Chen, Weihai Chen, Matthew Cutts, Brian Grant, Tim Hefel, Hye-Chung Kum, Man-Chi Leung, Qiang Liu, Noel Llopis- Artime, Rooma Madan, Sean Maher, Lisa Marchisello, Gopi Meenakshisundaram, Manuel Oliveira Neto, Bryon Nordquist, Michael North, Junghyun Park, Jiang Qian, Ramesh Raskar, Huiwen Ru, Sunay Tripathi, Matthew Werner, Randy Whitehead, Kyle Wilson, and Hansong Zhang.

Following are the median credentials for the 30 first-year students who began our program in fall 1995:

Quantitative GRE	93rd percentile
Verbal GRE	87th percentile
	(93rd with non-native speakers excluded)
Analytical GRE	94th percentile
GPA (undergraduate)	3.5/4.0

New staff members

Dixie Bloom, secretary, joined us in September. She recently relocated back to North Carolina from Denver, Colo. This is her second time working for UNC-Chapel Hill; from 1984 to 1987 she worked in the School of Public Health. She works with four faculty members--Prasun Dewan, Kye Hedlund, John B. Smith, and David Stotts.

Darlene Freedman, technology transfer and outreach secretary for the Graphics and Image Lab, joined us in June. She works with Mary Whitton, research assistant professor, and with Linda Houseman, public affairs and special projects coordinator for graphics. Darlene comes to us after 12 years at the Department of Computer Science at the University of Massachusetts in Amherst, Mass., where she was assistant to the chairman. Also at UMass, Darlene was an editorial assistant for the journal *ACM Transactions on Software Engineering and Methodology*.

John Sopko, systems programmer/administrator, joined us in August. John moved here from the Cleveland, Ohio, area where he worked for Uniscan, Inc., a software integration company specializing in UNIX client-server document management solutions. He also worked for Loral

Defense Systems in Akron, Ohio, doing UNIX system and network management. John has a B.S. in Electronic Technology and received his M.S. in Computer and Information Science from Cleveland State University in December 1994. He works for Computer Services and administers our Sun and DEC systems.

Michael D. Stone, electronics technician, joined us in May. He received his associates degree in Applied Science from Central Carolina Community College in 1987. Prior to joining us, Mike worked for five years at UNC-Chapel Hill's Electronic Office Service Center, performing maintenance and repairs on various computers and printers. He works for Computer Services, providing hardware support for Macintosh computers and laser printers.

We say thanks and farewell to:

York Davis, systems programmer/administrator, who left us in June to take a job with Glaxo-Wellcome in Research Triangle Park, N.C., as a systems administrator for Sun systems. During his year here, York worked for Computer Services administering our Sun and DEC systems. He handled the software side of the upgrade of our Sun-4/280 servers to new Sun SPARC 20 servers.

David Eberly (Ph.D. 1994), research associate professor, who left in August for a position at SAS Institute in Cary, N.C. He works in research and development in statistical graphics.

Jodi Fruth, secretary, who left in July for a position in the Center for Public Health Practice at UNC-Chapel Hill's School of Public Health. She is the project secretary for the Community-Based Public Health Initiative, sponsored by the Kellogg Foundation. Jodi had worked part time for the Medical Image Presentation Project since March 1994.

John Hughes, research associate, who left in June for a position as a customer support manager at Sarcos Corp., in Salt Lake City, Utah. John had worked with our Department for more than ten years. His primary work, with the GRIP project, was the restoration and maintenance of the Argonne Remote Manipulator and Sarcos hydraulic robot, along with all project records and purchases. He also helped to set up and to maintain the Graphics and Image Lab.

Carrie Stolle, secretary, who left in August to work at the Division of Continuing Education at UNC-Chapel Hill as a program facilitator in the Conferences and Institutes Office. Since April 1993, Carrie worked for several faculty members, including Prasun Dewan, Kye Hedlund, John Smith, and David Stotts. She also coordinated our bi-monthly birthday celebrations.

Thanks from Peter Calingaert

I was pleased and honored by the thoughts conveyed at my retirement party; from Fred Brooks's whitewash of my career to the letters sent by many former members of the Department. The few excerpts Steve Weiss read at the party do not do justice to the collection, which I treasure.

The framed certificate of appreciation hangs in a place of honor on the wall of my study. It did take a week of detective work to decipher some of the signatures: Steve Brumback and Audra Sugerman were the last to be unmasked. The framed color photograph of Sitterson Hall (without which no departure is official) stands in my living room. The gift certificate for travel will help to make possible my first trip to the Orient. The T-shirt with the Department's most famous monogram was inaugurated at a folk dance; to my chagrin no one asked for an explanation! It is unique in thought as well as in execution.

I am grateful to all who wrote, who contributed to the gifts, or who attended the retirement party, and also to those who were able to do "none of the above" but nevertheless mentally marked my departure with a kind thought.

Peter

Alumni news

Ronald Azuma (Ph.D. 1995) began working at Hughes Research Laboratories in Malibu, Calif., in March. He continues to work with virtual reality and plans to branch out into other areas of computer graphics and human-computer interfaces. One project involves building a car simulator to test new safety devices. He had a chance to meet up with friends and colleagues from Sitterson Hall at two recent events close to his new home turf: at the Symposium on Interactive 3D Graphics in Monterey, Calif., in April, and at SIGGRAPH '95 in Los Angeles, Calif., in July.

In July, **David C. Banks** (Ph.D. 1993) joined the computer science faculty at Mississippi State University as an assistant professor. He is teaching a graphics course this semester and will teach a visualization course in the spring. His research areas are computer graphics, flow visualization, and mathematical visualization. Previously, David held a post-doctoral fellowship at ICASE, a research group located at NASA Langley Research Center in Hampton, Va., and an adjunct faculty position in the Computer Science Department at Old Dominion University.

Rodger Blair (M.S. 1969) completed another M.S. in Computer Science in August, at the University of Pittsburgh. He is teaching a course on the structure of programming languages in the undergraduate computer science program at Pittsburgh. Rodger also consults with several high-tech software firms in the Pittsburgh area and has begun work on a new software product.

Following graduation, **Andrew Brandt** (M.S. 1993) moved to Colorado to start a multimedia CD-ROM software company called Inroads Interactive, which has since become an affiliate of Broderbund Software. Andy reports that the company's first CD-ROM titles, "Multimedia Dogs"

and "Multimedia Cats," have been instant hits. The company continues to work on CD-ROM titles for the educational and entertainment markets.

Congratulations to **Randy Brown** (M.S. 1990), who was recently promoted to senior systems developer at SAS Institute in Cary, N.C. He has been transferred to the Advanced Visualization Division, where he is the project leader for SAS/SPECTRAVIEW, SAS's volume visualization tool.

Congratulations also to **John Crawford** (M.S. 1977), who is the 1995 winner of the Eckert-Mauchly Award.

Matthew Fitzgibbon (M.S. 1989) recently started work at Darwin Molecular, a small startup company in Seattle, Wash. He is a scientist in the computing group, and will be working on protein structure prediction, sequence analysis, and possibly also on molecular graphics.

John Gauch (Ph.D. 1989) and **Susan Gauch** (Ph.D. 1990) are both at the University of Kansas in Lawrence, Kan. John recently received a Whitaker Foundation grant entitled "Object Motion Analysis for Biomedical Applications." Susan is the recipient of a NSF Research Initiation Award entitled "A Testbed for the Application of Corpus Linguistics to Information Retrieval."

Andrew Glassner (Ph.D. 1988) recently joined the graphics group at Microsoft Research in Redmond, Wash., where he is working on 3D graphics algorithms, content, and the social implications of computers. He has been appointed editor-in-chief of *ACM Transactions on Graphics*, and has founded the new *Journal of Graphics Tools*. His latest book, *Principles of Digital Image Synthesis*, was published this summer by Morgan-Kaufmann. Andrew will play Angelo in an upcoming production of "The Comedy of Errors."

Timothy S. Gramling (M.S. 1995) has joined Sprint Corp. in Kansas City, Mo. He is engaged to Kim Sellers, who works at the National Institute for Environmental Health Services in Research Triangle Park, N.C.

In August, **Richard L. Holloway** (Ph.D. 1995) started work as a software engineer at Division, Inc., in Chapel Hill, N.C.

William Leler (Ph.D. 1987) is finishing his second book, *3D with HOOPS*, about how to write graphics applications. It will be published by Addison-Wesley next spring. In his spare time he is learning to play the mandolin.

Mark Lumsden (M.S. 1982) works in Information Management at International Business Machines (IBM) Corp. in Research Triangle Park, N.C. He is working on architecture, technical strategy, and design for the Electronic Publishing and WebGroup families of products.

John Menges (M.S. 1990) has moved to Corvallis, Ore., to work for Hewlett-Packard on collaboration support for workstations.

Penny L. Rheingans (Ph.D. 1993) has joined the Computer Science faculty at the University of Mississippi, in Oxford, Miss.

Congratulations to **Yen-Ping Shan** (Ph.D. 1990) who was promoted in July to senior technical staff member at IBM Corp. He works in Advanced Object-Oriented Development at Research Triangle Park, N.C. Yen-Ping is chairman of the X3J20 ANSI Smalltalk Standard Committee and the lead architect on distributed and server Smalltalk.

Russ Tuck (Ph.D. 1990) recently started work on future architectures at Pyramid Technology in San Jose, Calif. The company makes high-availability servers for large commercial databases. He and his wife Debbi have a three-year-old son, Daniel, and are expecting a baby in January.

Edilberto N. Uichanco (M.S. 1988) married Marie Ann Villaruz on 7 October. They reside in the Philippines.

Keep in touch!

Let us know where you are and what you are doing so that we can include you in our next issue! Send us information via e-mail to *pubs@cs.unc.edu*; fax it to (919) 962-1799; or mail it to *News & Notes*, Department of Computer Science, CB#3175, Sitterson Hall, UNC- Chapel Hill, Chapel Hill, NC 27599-3175.

Some of our alumni now have their home pages linked to the Department's page at <http://www.cs.unc.edu>. If you'd like us to add a link to your home page, please let us know.

Electronic alumni mailing list

Our electronic alumni mailing list, which contains the e-mail addresses of many of our alumni and some former faculty and staff, is now up and running. The primary intent of this list is to send information to our alumni in a more timely manner than we can reach them through *News & Notes* and other sources. The list is moderated to ensure that members receive only information that is relevant or of interest. The list is also private, meaning that only subscribers may obtain a listing of the e-mail addresses of other subscribers.

To subscribe to the list:

Send e-mail to: *majordomo@cs.unc.edu*

In the body of the message, type: subscribe alumni

To post a message to the list:

Type: mail alumni@cs.unc.edu

Undergraduate alumni news*

Kathy Wolf (formerly Ayscue, B.S. 1992) works as a project leader and a programmer/database manager for E-OIR Measurements, Inc., a contractor with the U.S. Department of Defense. She married David Wolf on 7 October in Woodbridge, Va. Kathy is also a former member of our

staff. She worked part-time for Computer Services while in school, and then served as our Macintosh administrator for a year following graduation.

**Computer Sciences Options of the Applied Sciences and Mathematical Sciences Curricula*

Former faculty and staff news

We encourage former faculty and staff to join our alumni mailing list so that we may send them timely information about matters of interest. Follow the instructions in the "Electronic alumni mailing list" section above.

John McHugh, former research associate professor, became chair of the Computer Science Department at Portland State University in Portland, Ore., on 1 September. Also in September, John was awarded an ARPA grant for \$1.3 million to do research in mobile network security. He left us in summer 1993.

David and Jane Richardson are the first recipients of the Protein Society's Amgen Award. The award is given to researchers who have made innovations in protein science. David and Jane presented a lecture using interactive graphics (Mage and Sculpt) at the Protein Society's meeting in Davos, Switzerland. Their coauthored paper about the "alacoil," a new type of very tight, antiparallel coiled-coil found in globular proteins, will be published in the November issue of *Protein Science*. The magazine's cover will feature a picture created with VIEW (work by **Larry Bergman** [Ph.D. 1993]). Much of the work was done with Sculpt (work by **Mark Surles** [Ph.D. 1992]). David was a visiting associate professor in our Department during 1989-90, and Jane was a visiting research associate professor with us during 1990-91. They are both on the computer science faculty at Duke University.

Congratulations to . . .

Brooks wins Bower Award

Congratulations to **Frederick P. Brooks, Jr.**, Kenan professor, who will receive the 1995 Bower Award and Prize in Science in recognition for the significant contributions he made to the development of the revolutionary System 360 series of computers at IBM Corp. in the early 1960s.

Stephen F. Weiss, professor and chairman, who nominated him for the award, commented that Fred "did some things 30 years ago that are still part of computers today." System 360 allowed hardware and software to grow and change with users' needs.

The award of \$250,000 which was announced on 13 November will be presented by the Benjamin Franklin Institute in Philadelphia on 2 May 1996. Other recipients of the prestigious prize include Marie Curie, Albert Einstein, and the Wright Brothers.

Congratulations also to...

Jim Anderson, assistant professor, who has received several awards this year: the ACM Service Award in January, the Computer Science Students Association Teaching Award in April, and the U.S. Army Research Office Young Investigator Award in June.

David V. Beard, adjunct associate professor, who has joined the College of Business at Idaho State University, in Pocatello, Idaho, as an associate professor of computer information systems.

Debbie Blalock, who was promoted to accounting technician II on 18 September.

Christina Burbeck, who was promoted to research professor on 1 May.

James Coggins, who was the Steelman Visiting Scientist Lecturer at Lenoir-Rhyne College in Hickory, N.C., on 1-2 October. He met with various members of the science faculty and gave two lectures: a public lecture on virtual reality research, and a more technical talk to a more focused audience on current trends in computer science. The Steelman Visiting Scientist program is funded by a Lenoir-Rhyne alumnus, Dr. Sanford L. Steelman, Sr., and the Merck Foundation.

Kevin Jeffay, assistant professor, who has been promoted to associate professor, with tenure, effective January 1996.

Amy K. Kreiling, systems programmer, and **Helen Harrison** of SAS Institute, who were selected as co-chairs of the 1996 USENIX System Administration (LISA) conference to be held in September in Chicago, Ill. With annual attendance figures of 1500+ system administrators from around the world, the LISA conference has established itself as the premiere conference for those in the profession of supporting a computing environment.

Eileen Kupstas (M.S. 1992), graduate student, and her husband **Jeff Soo** who each won their divisions in the recent N.C. Croquet tournament, making them North Carolina's first husband and wife state championship team. The pair was interviewed on Chapel Hill's WCHL radio (fittingly; it's the flagship for the Tarheel Sports Network!)

Michael North, who was promoted to Systems Programmer II on 1 May.

John Poulton, who was promoted to research professor on 1 July.

Jan Prins, associate professor, who was appointed to be the Department's new director of graduate studies in July.

Tim Quigg, who was appointed by Chancellor Hooker for a one-year term on the University's Faculty Conflict of Interest Appeals Committee. The Committee will hear, mediate, and advise on appeals that arise under the newly published "Faculty Policy on Conflicts of Interest and Commitment."

John B. Smith (Ph.D. 1970), who was promoted to full professor on 1 July.

Russell M. Taylor II (Ph.D. 1994), research assistant professor, who was reappointed for a five-year term.

Greg Turk (Ph.D. 1992), research assistant professor, who was reappointed for a three-year term.

Stephen F. Weiss, who received the Computer Science Students Association Teaching Award in April.

To those faculty and staff members who attained the following level of State service as of August:

10 years: **Lynne Cohen Duncan** (M.S. 1985), **Madelyn Mann**

25 years: **Gyula Mago**, **Stephen F. Weiss**

And to our recent graduates:

Ph.D. May 1995: **Ronald T. Azuma**, **Jeffrey Hultquist**, **Bryan S. Morse**

Ph.D. August 1995: **Richard L. Holloway**, **Donald L. Stone**

M.S. May 1995: **Adam C. Duggan**, **Robert J. Dunn**, **Mark T. Finch**, **William F. Garrett***, **Christopher L. Georges**, **Timothy S. Gramling**, **Elizabeth B. Graves***, **George R. Greene***, **Vinay S. Gupta**, **Vincent A. Illiano**, **Lawrence A. Kesteloot**, **Pat Ko**, **Kunal Kundu**, **Atul N.arkhede**, **Pritvinath Obla**, **Jaykumar Padmanabhan**, **Scott C. Randolph**, **Scott E. Shauf**, **Audra D. Sugerman**, **Brian B. Upton**, **Gregory F. Welch***, **Robert W. Wheeler**, **Andrew W. Wooster**, **Yunshan Zhu***

*on to Ph.D. at UNC-Chapel Hill

Recent Ph.D. titles

Ronald T. Azuma, "Predictive Tracking for Augmented Reality" (Gary Bishop, advisor).

Richard L. Holloway, "Registration Errors in Augmented Reality Systems" (Frederick P. Brooks, Jr.).

Jeffrey Hultquist, "Interactive Numerical Flow Visualization Using Stream Surfaces" (Frederick P. Brooks, Jr.).

Bryan S. Morse, "Computation of Object Cores from Grey-level Images" (Stephen M. Pizer).

Donald L. Stone, "Managing the Effect of Delay Jitter on the Display of Live Continuous Media" (Kevin Jeffay).

Fellowships and special assistantships

These students received the following special awards during the 1995-96 academic year:

Jonathan Cohen	Link Foundation Fellowship
Matthew Cutts	National Science Foundation Fellowship
Qiang Liu	Board of Governors Fellowship
David Luebke	IBM Fellowship
Leonard McMillan	Division Fellowship
Mark Moir	Department Alumni Fellowship
Grayson Morris	National Science Foundation Fellowship
Jon Munson	IBM Fellowship
Manuel Oliveira Neto	Brazilian Government Fellowship
James Riely	Graduate School On-Campus Dissertation Fellowship
Hans Weber	Link Foundation Fellowship
Kyle Wilson	Merit Assistantship from the Department

These awards were renewed:

Rui Bastos	Brazilian Government Fellowship (2nd year)
Carl Erikson	National Science Foundation Fellowship (2nd year)
Thomas Hudson	Board of Governors Fellowship (2nd year)
John Keyser	Office of Naval Research Fellowship (2nd year)
Mark Parris	IBM Fellowship (2nd year)
Viswanath Srikanth	Board of Governors Fellowship (3rd year)
Jason Wilson	National Science Foundation Fellowship (2nd year)

December commencement

December graduation exercises for UNC-Chapel Hill will take place at 2:00 p.m. on Sunday, 17 December at the Dean E. Smith Center. More than 1,000 students are expected to participate in the ceremony.

Family matters

Nathan Samuel Bell was born on 2 October 1994 in Mableton, Ga., to Andrew Bell (M.S. 1991) and Leslie Bell.

Fred and Nancy Brooks have two new grandchildren. **Frederick Phillips Brooks** was born on 27 October in Tarrytown, N.Y., to Roger G. Brooks and Ann Jarkesy Brooks. **Mary Arwen LaDine** was born on 26 June in Chapel Hill, N.C., to Jeff and Barbara (Brooks) LaDine.

David John Gauch was born on 29 October 1994, in Lawrence, Kan., to John Gauch (Ph.D. 1989) and Susan Gauch (Ph.D. 1990). He has two older siblings, Laura and Brian.

David Harrison and **Karen Coley** were married on 24 April in Charlottesville, Va.

Rhiannon Sophia Faith was born on 9 July in Durham, N.C., to Rick Faith (M.S. 1994) and Melissa Clepper-Faith.

Dylan Raymond Mine was born on 4 November in Chapel Hill, N.C., to Mark and Sandra Mine.

Grant Steven Molnar was born on 1 November in Chapel Hill, N.C., to Steve Molnar (Ph.D. 1991) and Wanda Molnar. He has two older sisters, Jennifer and Laura.

Daniel Schilling Munson was born on 25 September in Chapel Hill, N.C., to Jon Munson and Beth Schilling.

Roman Annias Scher was born on 6 June in Durham, N.C., to Bruce Scher and Jannick Rolland. He has an older brother, Yvan, who is two and half years old.

Jonah Kyle Scher-Zagier was born on 24 August in Chapel Hill, N.C., to Alan and Ellen Scher Zagier.

Reid Walter Smith was born on 18 September in Greensboro, N.C., to Phillip and Dana Kay Smith. He has an older sister, Lucy, who is two and a half years old.

Xiaojun Wang and **Jing Shi** were married on 18 August in Hangzhou, China.

Research highlights

Alumni fellowship

Mark Moir is the recipient of the fifth annual Department Alumni Fellowship for the 1995-96 academic year. The award is supported by the Alumni Trust Fund and is given to Ph.D. candidates in the last year of study, allowing them to work full time on dissertation research.

Mark is working with **Jim Anderson**, assistant professor, on his dissertation, "Efficient Shared Object Implementations for Shared-Memory Multiprocessors." The primary goal of his work is to enable the efficient and transparent use of highly concurrent shared objects in asynchronous (MIMD), shared-memory multiprocessing environments. The use of mutual exclusion in such environments can be quite problematic, especially if process delays are common. This is the case in multiprogrammed systems, for example, where processes are frequently delayed for relatively long periods of time due to preemption. Mark's work focuses on designing lock-free and wait-free implementations of shared objects. These implementations do not use mutual exclusion and, as a result, can greatly improve performance in multiprogrammed environments. They also are useful in real-time systems, where the use of mutual exclusion greatly complicates scheduling.

Previous lock-free and wait-free implementations for shared objects avoid the pitfalls associated with locking, but do so at the cost of high space and time overhead, which has generally been prohibitive. Mark seeks to overcome all of these problems by using new techniques for lock-free and wait-free shared object implementations. These new techniques significantly reduce both the time and space overhead of previous techniques and also greatly improve transparency.



Alumni fellow Mark Moir at work in his office (Photo by Li-Yun Yu)

Project news

BrainLab

The **BrainLab** research group, led by **Jonathan Marshall**, assistant professor, has established a new lab space on the third floor of Sitterson Hall. The BrainLab supports interdisciplinary research and education on the function, architecture, and development of neural computation systems. Researchers focus on neural models of visual perception, including depth perception, motion perception, and image segmentation. The research involves building models and running simulation experiments to reveal fundamental principles and constraints that underlie the organization, operation, and formation of human and animal visual systems. Lab facilities include a collection of journals, books, and papers, two Hewlett-Packard 9000/J210 workstations for high-speed processing of neural network simulations, and several simulation and visualization software packages.

Nanomanipulator project

Project members are working with viruses and other biological specimens, in collaboration with biological scientists from around the country. The project has recently been awarded several grants. An Academic Research Infrastructure grant from the National Science Foundation (NSF), entitled "Development of the Nanomanipulator: A Real-Time Scanning Probe Microscope Interface for Nanometer Science," is helping to fund two pieces of equipment--a Topometrix Scanning Probe Microscope and an SGI Onyx machine. They will be part of the Nanomanipulator station that has been set up in Phillips Hall for collaborators to use as a full-time experiment station. The grant will also support two graduate students for two years.

A five-year HPCC grant, also from NSF, entitled "Application of High- Performance Graphics Supercomputers and Communication to Provide Improved Interfaces to Scanning Probe Microscopes," provides funding to explore the use of next-generation graphics and networking hardware. Principal investigators for the grants are **Richard Superfine**, assistant professor, and **Sean Washburn**, professor, of the Physics and Astronomy Department at UNC-Chapel Hill, and **Fred Brooks**, Kenan professor, **Vernon Chi**, MSL Director, and **Russell M. Taylor II** (Ph.D. 1994), research assistant professor, of our Department.

Pixel-Planes/PixelFlow

Pixel-Planes is 15 years old!

On 21 October, current members of the Pixel-Planes group and project alumni celebrated the fifteenth anniversary of Pixel-Planes at the Carolina Club in Chapel Hill, N.C. Pixel-Planes began as an idea by **Henry Fuchs**, Federico Gil professor, and a class project by **John Poulton**, research professor. Since its conception, five generations of Pixel-Planes prototypes have been built at UNC-Chapel Hill. Commercial systems using Pixel-Planes technology are now being delivered to customers.

Pixel-Planes 6 operational

Pixel-Planes 6, the Division, Inc., product that evolved from UNC-Chapel Hill's Pixel-Planes 5, is now operational. The Division dVS virtual reality system runs on Pixel-Planes 6 on top of a modified UNC-Chapel Hill PPHIGS graphics library. A Pixel-Planes 6 system is now in

operation at Matsushita Electric Works in Osaka, Japan. It was installed in March with one rack, and upgraded to two racks in July. It contains 20 renderers and 14 graphics processors. Polygon rendering performance is about midway between a 2-rack and 3-rack Pixel-Planes 5 system. The new system is being used by the virtual reality research group at Matsushita for living environment design, which includes views of yet-to-be-built houses. In addition to the usual building walk-throughs, the group also conducts air flow visualizations using Pixel- Planes 6.

PixelFlow chip developments

Chips for PixelFlow are in various stages of development. The Image Generation Controller chip has been completed and is in fabrication at Hewlett Packard. **John Eyles** (Ph.D. 1982), research assistant professor, is its principal designer. Another PixelFlow chip, the Texture ASIC, is also finished and will soon go into fabrication. **Steven Molnar** (Ph.D. 1991), research assistant professor, is the principal designer.

Three other chips--EMC (Enhanced Memory Chip), RHInO (Runway Host and IO), and GNI (Geometry Network Interface)--are nearing completion and are scheduled to be finished before the end of the year. Developers hope to demonstrate a working PixelFlow system, rendering millions of polygons per second, at SIGGRAPH '96.

Legislators try Division system

On 17 and 18 May, representatives from our Department traveled to the N.C. State Legislature in Raleigh to demonstrate the Division 100VPX system, which is based on Pixel-Planes technology. The demonstration was part of an exhibit to promote awareness of graphics and imaging research and industry within the state.

Approximately 40 members of the N.C. House and Senate tried on the head- mounted display and went through the walkthrough demo. The demonstrators emphasized that this leading commercial product is based on technology developed at UNC-Chapel Hill and that it has resulted in a significant amount of business being introduced into the state. The demonstration was well-received and legislators seemed pleased to learn about the leading role that UNC-Chapel Hill's research is taking and about the successful technology transfer that has been taking place.

Ultrasound project

On 3 April, the Ultrasound Project conducted its first human subject experiment of the ultrasound image-guided cyst aspiration procedure. The procedure involves the application of computer augmented vision to breast biopsies and cyst aspirations. The experiment to evaluate the system's performance on a real patient was successful. Researchers are working to improve the 3D representation of the lesion and to improve the registration of the images. They hope to perform the procedure on a real patient next spring.

Vision laboratory

Created in 1992, the Vision Lab has been home to some exciting research. Recently, researchers found strong supporting evidence for the core theory as a model of human shape perception. Core theory, developed under the leadership of **Stephen M. Pizer**, Kenan professor, and **Christina Burbeck**, research professor, states that simple objects are represented by a fuzzy medial axis which captures the object's width and the location of its center. This representation allows us to see the overall shape of an object, independent of small variations at its boundaries. This research is sponsored by the National Cancer Institute and the Air Force Office of Scientific Research.

Other recent work focused on how the human visual system represents sets of similar objects, such as a row of fence posts, or a shelf of books. Researchers have found that the human brain encodes an accurate prototype together with a measure of the deviation from that prototype in the set, rather than representing each item individually. Christina and her colleagues have shown that this method of encoding affects the saliency of objects in the scene. This research is sponsored by the Air Force Office of Scientific Research.

Jannick Rolland, research assistant professor, and fellow researchers have completed a prototype of an optical bench head-mounted display to study perception in virtual environments. The system allows for interpupillary distance adjustment as well as for virtual images location adjustment. In studies, researchers found that the shape of the stimuli used in judging relative depth of two objects plays a role in both accuracy and precision of perceived depth. Experiments are being run to quantify this finding more thoroughly. The research, supported by the Office of Naval Research, has benefitted greatly from informal collaborations with **Nat Durlach** and colleagues from MIT, **Steve Ellis** of NASA, and **Heinrich Buelthoff** of the Max-Planck Institute.

Jannick and **Christopher Helvig**, undergraduate, are working to understand how humans search for abnormalities in complex backgrounds. One application involves searching for a way to narrow blood vessels in angiograms. The techniques developed will have an impact on how researchers conduct future search experiments in complex backgrounds. This research is supported by the National Cancer Institute.

Other work includes pseudo-clinical studies in mammography, under the direction of Jannick and **Etta Pisano, M.D.**, associate professor, of the Radiology Department at UNC-Chapel Hill. Researchers are using an eye-tracker device to monitor how radiologists look at subtle mammogram cases. The research is supported by the National Cancer Institute.

Walkthrough project

The Walkthrough team is collaborating with Lockheed Space and Missiles Division on the ARPA Simulation-Based-Design Phase II project. Researchers are working on the virtual environments visualization and real-time modification component of the design system. The first real user will be the Newport News Shipbuilding Company, which is designing a new product line of petroleum tanker ships. Researchers are also working with the U.S. Army Research Labs to model and to interactively display a Bradley fighting vehicle.

Conferences/workshops

SIGGRAPH '95

Nearly 30 students and 10 faculty and staff members attended SIGGRAPH '95 in Los Angeles, Calif., from 6-11 August.

Graduate student **Leonard McMillan** presented his paper, "Plenoptic Modeling: An Image-Based Rendering System." **Ron Azuma** (Ph.D. 1995) presented his paper, "A Frequency-Domain Analysis of Head-Motion Prediction." **Gary Bishop**, research associate professor, co-authored both papers. **Anselmo Lastra**, research assistant professor, **Mark Mine**, graduate student, and three other lecturers, co-taught "Programming Virtual Worlds," an introductory virtual reality course.

Nick England, research professor, and **Mary Whitton**, research assistant professor, organized the NC/Vision booth, which promoted graphics and imaging technology in North Carolina, including work done at UNC-Chapel Hill. They also helped with NC/Vision's newsletter which was distributed at the conference. NC/Vision's campaign is sponsored by the Interactive Visual Technologies Center, a non-profit group created by the NC Board of Science and Technology. Nick, Mary, and **Fred Brooks** are on the board of directors.

Nearly 100 alumni attended a reunion on 9 August at the Los Angeles Convention Center. The reunion is an annual event held every year at SIGGRAPH.

STC student workshop

From 22-28 March, our Department hosted the first student workshop of the Science and Technology Center (STC) for Computer Graphics and Scientific Visualization. Students from all five schools in the STC--UNC-Chapel Hill, Cornell University, Brown University, Caltech, and the University of Utah-- participated in the five-day, student-planned, student-led workshop. Participants presented their research and discussed current and future collaborative efforts. A second workshop was held in November at Brown University.

Conferences in 1996

Our faculty are involved in organizing several conferences:

ACM Hypertext '96, Washington, D.C., 16-20 March. David Stotts, associate professor, general chair.

ACM Workshop on Applied Computational Geometry, Philadelphia, Pa., 27-28 May. Ming Lin, adjunct assistant professor, and Dinesh Manocha, assistant professor, program co- chairs.

Second IEEE Real-Time Technology and Applications Symposium, Boston, Mass., 10-12 June. Kevin Jeffay, assistant professor, program chair.

Mathematical Psychology Conference, Chapel Hill, N.C., 1-4 August, Jonathan Marshall, assistant professor, co-chair.

Distinguished lecturer series

The computer science departments at UNC-Chapel Hill, Duke, and NC State have joined forces to create the Triangle Computer Science Distinguished Lecturer Series. This series follows our Department's own lecture series which featured three distinguished speakers during the spring.

Jim Anderson, assistant professor, was instrumental in planning and organizing the series, which is made possible by a three-year grant from the U.S. Army Research Office. Directions to the talks, abstracts, and biographies are available at: <http://www.cs.unc.edu>. For more information, contact Jim at (919) 962-1757, or send e-mail to anderson@cs.unc.edu. There are nine speakers for the 1995-96 series:

2 October 1995	Monica S. Lam, Stanford University
Host: Duke	"The Stanford SUIF Parallelizing Compiler"

6 November 1995	Dennis Gannon, Indiana University
Host: UNC-CH	"High Performance Computing: Life After the HPCC Program"

20 November 1995	Mitchell Marcus, University of Pennsylvania
Host: Duke	"New Trends in Natural Language Processing"

22 January 1996	Franco P. Preparata, Brown University
Host: Duke	"Horizons of Parallel Computing"

5 February 1996	John A. Stankovic, University of Massachusetts
Host: NC State	"Key Dilemmas in Real-Time Systems"

19 February 1996	H. T. Kung, Harvard University
Host: UNC-CH	"Traffic Management for Very High-Speed Networks"

18 March 1996	David Dobkin, Princeton University
Host: UNC-CH	"Applied Computational Geometry: Progress Report"
1 April 1996	Mani Chandy, California Institute of Technology
Host: NC State	"Patterns of Specifications"
15 April 1996	Gene H. Golub, Stanford University
Host: NC State	"Applications of the Theory of Moments to Large Scale Computations"

Talks at Duke

Mondays, 4:00 p.m., 130A North Bldg.
Receptions: 3:30 p.m., D106 LSRC Bldg.

Talks at NC State

Mondays, 4:00 p.m., Studio B, Park Shops
Receptions: 3:30 p.m., Lounge, Park Shops

Talks at UNC-Chapel Hill

Mondays, 4:00 p.m., 011 Sitterson Hall
Receptions: 3:30 p.m., lobby, Sitterson Hall

Other News

Research assignment

James Coggins, associate professor and associate chairman for academics, is taking a research and study assignment during fall 1995, to pursue several projects relating to research and Department administration. He is studying distributed systems with the objective of making the development of distributed components the normal, natural way to develop research software in the laboratory. He is also working on a research proposal with the Department of Ophthalmology at UNC-Chapel Hill to create mathematical methods for measuring and comparing the shape of human corneas. Another project involves evaluating and improving our Department's presence on the World Wide Web. James is also devising procedures for electronically supporting the Department's faculty recruiting efforts next spring.

New software license agreement

The Portland Group, Inc. (PGI) has entered into a software license agreement with UNCPChapel Hill to provide source code access for its High Performance Fortran (HPF) compiler. PGI is a major vendor of compiler software, and the availability of its source code will provide **Siddhartha Chatterjee**, assistant professor, with a technology transfer path for his research on automatic data and computation partitioning of array- parallel codes. The agreement runs from May 1995 through December 1996.

Mythical Man-Month anniversary!

The twentieth anniversary edition of **Fred Brooks's** influential book, *The Mythical Man-Month*, was published by Addison-Wesley in July. Four new chapters are included in this special edition, one of which is a reprint of FredUs 1986 IFIPS paper "No Silver Bullet."

The Mythical Man-Month continues to be popular after 20 years. Fred reports that the book has had a readership outside the software engineering community, generating reviews, citations, and correspondence from lawyers, doctors, psychologists, and sociologists, as well as from software people. Over 250,000 copies of the original English language edition are in print. It has also been translated into Dutch, German, Japanese, and Russian.

Recent publications

Anderson, J., and M. Moir. "Universal Constructions for Large Objects," *Proc. Ninth International Workshop on Distributed Algorithms*, Sept. 1995. Lecture Notes in Computer Science 972, Springer-Verlag, 168- 182.

Anderson, J., and M. Moir. "Universal Constructions for Multi-Object Operations," *Proc. 14th Annual ACM Symposium on Principles of Distributed Computing*, Aug. 1995, 184-193.

Anderson, J., and S. Ramamurthy. "Using Lock-Free Objects in Hard Real- Time Applications," *Proc. 14th Annual ACM Symposium on Principles of Distributed Computing*, Aug. 1995, 272.

Azuma, R., and G. Bishop. "A Frequency-Domain Analysis of Head-Motion Prediction," *Computer Graphics: Proc. SIGGRAPH '95*, Los Angeles, Calif., 6-11 Aug. 1995, 401-408.

Blelloch, G. E., S. Chatterjee, and M. Zagha. "Solving Linear Recurrences with Loop Raking," *Journal of Parallel and Distributed Computing*, 25(1), Feb. 1995, 91-97.

Bollella, G., and K. Jeffay. "Support For Real-Time Computing Within General Purpose Operating Systems: Supporting Co-resident Operating Systems," *Proc. IEEE Real-Time Technology and Applications Symposium*, Chicago, Ill., May 1995, 4-14.

Burbeck, C., and S. M. Pizer. "Object Representation by Cores: Identifying and Representing Primitive Spatial Regions," *Vision Research*, 35(13), 1995, 1917-1930.

Chatterjee, S., J. R. Gilbert, F.J.E. Long, R. Schreiber, and S.-H. Teng. "Generating Local Addresses and Communication Sets for Data-Parallel Programs," *Journal of Parallel and Distributed Computing*, 26(1), April 1995, 72-84.

Chatterjee, S., J. R. Gilbert, R. Schreiber, and S.-H. Teng. "Optimal Evaluation of Array Expressions on Massively Parallel Machines," *ACM Transactions on Programming Languages and Systems*, 17(1), Jan. 1995, 123-156.

Cohen, J., M. Lin, D. Manocha, and K. Ponamgi. "I-COLLIDE: An Interactive and Exact Collision Detection System for Large-Scale Environments," *Computer Graphics: Proc. 1995 Symposium on Interactive 3D Graphics*, Monterey, Calif., 9-12 April 1995, 189-196.

Dewan, P., K. Jeffay, J. B. Smith, D. Stotts, and W. Oliver. "Early Prototypes of the Repository for Patterned Injury Data," *Proc. Digital Libraries '95*, Austin, Texas, June 1995, 123-130.

Finch, M., V. Chi, R. M. Taylor II, M. Falvo, S. Washburn, and R. Superfine. "Surface Modification Tools in a Virtual Environment Interface to a Scanning Probe Microscope," *Computer Graphics: Proc. 1995 Symposium on Interactive 3D Graphics*, Monterey, Calif., 9-12 April 1995, 13-18.

Goldberg, A., J. Prins, J. Reif, R. Faith, Z. Li, P. Mills, L. Nyland, D. Palmer, J. Riely, and S. Westfold. "The Proteus System for the Development of Parallel Applications," *Prototyping Languages and Prototyping Technology*, M. Harrison, ed., Springer-Verlag, 1995, 151-190.

Goldberg, A., P. Mills, L. Nyland, J. Prins, J. Reif, and J. Riely. "Specification and Development of Parallel Algorithms with the Proteus System," *Specification of Parallel Algorithms*, G. Blelloch, M. Chandy, and S. Jagannathan, eds., American Mathematical Society Press, 1995, 383-399.

Horwitz, S., J. Prins, and T. Reps. "Integrating Non-Interfering Versions of Programs," *Software Merging and Slicing*, V. Berzins, ed., IEEE Computer Society Press, 1995, 137-190.

Interrante, V., H. Fuchs, and S. Pizer. "Enhancing Transparent Skin Surfaces with Ridge and Valley Lines," *Proc. Visualization '95*, Atlanta, Ga., 30 Oct.-3 Nov. 1995, 52-59.

Kancherla, A. R., J. P. Rolland, D. L. Wright, and G. Burdea. "A Novel Virtual Reality Tool for Teaching Dynamic 3D Anatomy," *Proc. CVRMed '95*, 1995, 163-169.

Keller, K., and J. Poulton. "Commercial Packaging Solutions for a Research Oriented Graphics Supercomputer," *Advances in Electronic Packaging 1995: Proc. International Intersociety Electronic Packaging Conference '95*, Lahaina, Hawaii, 1, March 1995, 53-59.

Krishnan, S., and D. Manocha. "Numeric-Symbolic Algorithms for Evaluating One-Dimensional Algebraic Sets," *Proc. ACM International Symposium on Symbolic and Algebraic Computation*, Montreal, Canada, 1995, 59-67.

Krishnan, S., A. Narkhede, and D. Manocha. "Representation and Computation of Boolean Operations of Sculptured Models," *Proc. ACM Conference on Computational Geometry*, 1995, C8-C9.

Kumar, S., and D. Manocha. "Efficient Rendering of Trimmed NURBS Surfaces," *Computer-Aided Design (Special issue on Visualization of Surfaces)*, 27(7), 1995, 509-521.

Kumar, S., D. Manocha, and A. Lastra. "Interactive Display of Large Scale NURBS Models," *Computer Graphics: Proc. 1995 Symposium on Interactive 3D Graphics*, Monterey, Calif., 9-12 April 1995, 51-58.

Lastra, A., S. Molnar, M. Olano, and Y. Wang. "Real-Time Programmable Shading," *Computer Graphics: Proc. 1995 Symposium on Interactive 3D Graphics*, Monterey, Calif., 9-12 April 1995, 59-66.

Lastra, A. A. "The Unix Programming Environment," *The UNIX System Guidebook*, D. Brock, ed., McGraw Hill, 1995, 69-110.

Lin, M. C., D. Manocha, and M. K. Ponamgi. "Fast Algorithms for Penetration and Contact Determination between Non-Convex Polyhedral Models," *Proc. International Conference on Robotics and Automation*, 1995, 2707-2712.

Luebke, D. P., and C. L. Georges. "Lazy Evaluation of Potentially Visible Sets," *Computer Graphics: Proc. 1995 Symposium on Interactive 3D Graphics*, Monterey, Calif., 9-12 April 1995, 105-106.

Manocha, D., and J. Demmel. "Algorithms for Intersecting Parametric and Algebraic Curves II: Multiple Intersections," *Computer Vision, Graphics and Image Processing: Graphical Models and Image Processing*, 57(2), 1995, 81-100.

Manocha, D., Y. Zhu, and W. Wright. "Conformational Analysis of Molecular Chains using Nano-Kinematics," *Computer Applications in the Biosciences*, 11(1), 1995, 71-86.

Marshall, J. A. "Motion Perception: Self-Organization," invited review, *The Handbook of Brain Theory and Neural Networks*, M. Arbib, ed., Cambridge, Mass: MIT Press, June 1995, 589-591.

Marshall, J. A. "Adaptive Perceptual Pattern Recognition by Self-Organizing Neural Networks: Context, Uncertainty, Multiplicity, and Scale," *Neural Networks*, 8, April 1995, 335-362.

McMillan, L., and G. Bishop. "Plenoptic Modeling: An Image-Based Rendering System," *Computer Graphics: Proc. SIGGRAPH '95*, Los Angeles, Calif., 6-11 Aug. 1995, 39-46.

McMillan, L., and G. Bishop. "Head-Tracker Stereo Display Using Image Warping, in Stereoscopic Displays and Virtual Reality Systems II," *Proc. 1995 IS&T/SPIE Symposium on Electronic Imaging Science and Technology*, #2409, San Jose, Calif., 5-10 Feb. 1995, 21-30.

Narkhede, A., and D. Manocha. "Fast Polygon Triangulation Based on Seidel's Algorithm," *Graphics Gems*, V, A. Paeth, ed., Academic Press, 1995, 394-397.

Olano, M., J. Cohen, M. Mine, and G. Bishop. "Combatting Rendering Latency," *Computer Graphics: Proc. 1995 Symposium on Interactive 3D Graphics*, Monterey, Calif., 9-12 April 1995, 19-24.

Paramasivam, M., and D. A. Plaisted. "Automated Deduction Techniques for Subsumption Checking in Concept Languages," *Proc. Fourth Golden West International Conference on Intelligent Systems*, San Francisco, Calif., 12- 14 June 1995, 122-126.

Ponamgi, M., D. Manocha, and M. Lin. "Incremental Collision Detection Between Solid Models," *Proc. 11th ACM Computational Geometry Conference*, Vancouver, Canada, June 1995, V7-V8.

Ponamgi, M., D. Manocha, and M. Lin. "Incremental Algorithms for Collision Detection Between General Solid Models," *Proc. ACM/SIGGRAPH Symposium on Solid Modeling*, Salt Lake City, Utah, May 1995, 293- 304.

Rolland, J. P., D. Ariely, and W. Gibson. "Towards Quantifying Depth and Size Perception in Virtual Environments," *Presence*, 4(1), 1995, 24-49.

Rolland, J. P., F. A. Biocca, T. Barlow, and A. Kancherla. "Quantification of Perceptual Adaptation to Visual Displacement in See-thru Head-mounted Displays," *Proc. IEEE VRAIS'95*, 1995, 56-66.

Stone, D. L., and K. Jeffay. "An Empirical Study of Delay Jitter Management Policies," *ACM Multimedia Systems*, 2(6), Jan. 1995, 267-279.

Taylor, R. M. "Requirements and Availability of Application Programmer's Interfaces for Virtual-Reality Systems," *our technical report TR95-009*, April 1995.

Yang, J.-H., and J. Anderson. "A Fast, Scalable Mutual Exclusion Algorithm," *Distributed Computing*, 9, 1995, 51-60.

Yoshida, A., J. P. Rolland, and J. H. Reif. "Design and Applications of a High Resolution Insert Head-Mounted Display," *Proc. VRAIS'95*, 1995, 84- 93.

Patents issued

Chi, V. "Salphasic Distribution of Timing Signals for the Synchronization of Physically Separated Entities," U.S. Pat. No. 5,387,885, issued 7 Feb. 1995.

Gilbert, J. R., S.-H. Teng, R. S. Schreiber, S. Chatterjee, and F.J.E. Long. "Generating Local Addresses and Communication Sets for Data-Parallel Programs," U.S. Pat. No. 5,450,313, issued 12 Sept. 1995.

Poulton, J., S. Molnar, and J. Eyles. "Architecture and Apparatus for Image Generation," U.S. Pat. No. 5,388,206, issued 7 Feb. 1995.

New contracts and grants

James Anderson, assistant professor. "Mechanisms for Scalable Object Sharing in MIMD Multiprocessing Systems," Young Investigator Award from the U.S. Army Research Office.

James Anderson. "Research Triangle Computer Science Lecture Program," from the U.S. Army Research Office.

Fred Brooks, Kenan professor, **Vernon Chi**, MSL Director, and **Russell M. Taylor II**, research assistant professor (computer science); **Richard Superfine**, assistant professor, and **Sean Washburn**, professor (physics). "Application of High-Performance Graphics Supercomputers and Communication to Provide Improved Interfaces to Scanning Probe Microscopes," HPCC grant from the National Science Foundation.

Siddhartha Chatterjee, assistant professor. "Automatic Data and Computation Partitioning for Array-Parallel Languages," from the National Science Foundation.

Siddhartha Chatterjee. Faculty Research Award from the University Research Council at UNC-Chapel Hill.

Kevin Jeffay, assistant professor. "An Examination of Flow and Congestion Control Mechanisms for Media Transmission in Collaborative Systems," from IBM Corp.

Richard Superfine and **Sean Washburn** (physics); **Fred Brooks**, **Vernon Chi**, and **Russell M. Taylor II** (computer science). "Development of the Nanomanipulator: A Real-Time Scanning Probe Microscope Interface for Nanometer Science," Academic Research Infrastructure grant from the National Science Foundation.

Russell M. Taylor II. CISE Postdoctoral Research Associate grant from the National Science Foundation.

In the media

A photograph of Henry Fuchs, Federico Gil professor, presenting a lecture on computed tomography data appears on page 61 of the July/August 1995 issue of the *Carolina Alumni Review*, as part of an article about UNCD Chapel Hill's reaccreditation process.

The Nanomanipulator was featured in a recent UPN network documentary called "The Secret of"

Some of our special visitors

Some of our guests during this past spring and summer:

Barry Aldred of IBM Corp. in Hursley, England, visited the DiRT group on 21 June. Kevin Jeffay was his host.

On 22-23 May, Jonathan Marshall and Jannick Rolland hosted **Heinrich Buelthoff** of the Max-Planck Institute, Germany, **Raymond van Ee**, **Maarten Hogervorst**, and **Hendrik-Jan van Veen** of the University of Utrecht, the Netherlands, and **Eric Fredericksen** (Ph.D. 1993) of McGill University, Canada. They met faculty and students to discuss research. The Utrecht visitors gave a presentation on their work.

Pau-Chen Cheng of IBM's T. J. Watson Research Center visited on 12 May and spoke on "Design and Implementation of Modular Key Management Protocol and IP Secure Tunnel on AIX." Jim Anderson was his host.

On 4 May, members of the **N.C. Department of Commerce** visited the Department to discuss research and to see demos of the Nanomanipulator and tracker.

Gunner Daneels and **Ketan Sampat** of the Communications Technology Laboratory at Intel Corp., in Hillsboro, Ore., visited the DiRT group on 17 April. Kevin Jeffay was their host.

Paul Dietz, Mike Muuss, Paul Stay, and Paul Tannenbaum of the U.S. Army Research Laboratories visited on 26-27 June. Dinesh Manocha was their host.

Michael C. Doggett, a Ph.D. student in computer science at the University of New South Wales, Australia, visited on 11 and 12 September. He spoke on "An Array Based Design for Real-Time Volume Rendering." Steve Molnar was his host.

Gary DuBro of NASA and **Dave Honam** of the Johnson Space Center visited the Graphics and Image Lab on 23 August. They met with Fred Brooks, Henry Fuchs, and other project leaders.

Carla Ellis of the Computer Science Department at Duke University gave an overview of her department's systems research at Systems Lunch on 28 September. Kevin Jeffay was her host.

Jim Gray, Barron Housel, and Tim Tooley of IBM Corp. in Research Triangle Park, N.C., visited on 5 September. Kevin Jeffay was their host.

Paul Hemler of Stanford University visited on 1 March. He spoke on "A Quantitative Comparison of Residual Error for Three Different Multimodality Registration Techniques."

Tom Henderson, chair of the Computer Science Department at the University of Utah, visited the Graphics and Image Lab on 28 June. He gave a talk entitled "Computer Aided Prototyping." Dinesh Manocha was his host.

Marco Jacobs, a visiting scholar from the University of Delft, the Netherlands, arrived in October to spend nine months working with the Ultrasound group, while finishing a Master's thesis.

Twan Maintz, who researches multimodality image registration at the University of Utrecht, the Netherlands, visited in May and June. Stephen Pizer was his host.

David Orton of Silicon Graphics, Inc. visited on 21 April. He spoke on "Support Structures for Scalable Architectures in the SGI Reality Engine 2."

Fourteen visitors from **Shimane, Japan**, hosted by the U.S. Army Research Office, visited on 23 August for a demo of the Nanomanipulator and a tour of the Graphics and Image Lab.

Bob Steen of IBM Corp. in Research Triangle Park, N.C., visited the DiRT group on 22 June. Kevin Jeffay was his host.

Seth Teller of MIT visited on 26 April. He spoke on "Interactive Parallel Evaluation and Display of Global Illumination Data." Dinesh Manocha was his host.

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The Graphics and Image Lab continues to attract numerous visitors. Linda Houseman, public affairs and special projects coordinator for graphics, reports that between 1 January and 30

September, the lab had nearly 1100 visitors. Between 1 April and 30 September, approximately 600 visitors were given demos.

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Site visits

Members of the **Medical Image Presentation Advisory Committee** visited on 23-24 October for a mock site visit. The official visit by the **National Cancer Institute** was held on 2 November.

Representatives from the special study section of the **National Institutes of Health** visited the GRIP Project on 15 June for its five-year renewal proposal.

Representatives from the **National Science Foundation** made a site visit to the Collaboratory group on 12 April.

U.S. Army Research Office representatives attended a site visit for the Nanomanipulator project on 5 June.

CSA news

1995-96 CSA Officers:

President:	Michael Capps
Money Man & Surviving Stuff:	Tom Hudson
Athletic Guy:	Carl Erikson
Partymeisters:	Lars Bishop, Jason Smith
Soda Jerk:	Eddie Saxe

Business

- The CSA "Open Dum-Dum" policy was announced. The CSA president admits he is a dum-dum, and invites students, faculty, and staff to take advantage of his open door. Those with questions or comments about CSA issues get a free Dum-Dum lollipop. One can stay current on faculty lunch issues by reading his offbeat version of the minutes on the 'student' newsgroup.
- The CSA Cabinet meets every other Friday at 11:00 a.m. in Sitterson 006. All students are free to join the discussions, which are held to ascertain student opinions on important issues raised at faculty lunch.
- The Department Review system is in full swing. By late fall all students will receive instructions on how to comment on their courses and professors using the World Wide Web forms. Direct your questions to **Mike Meehan**.

Social

- CSA has been hosting weekly showings of "Star Trek: Voyager" on Mondays, as well as Thursday night viewings of "Babylon 5" and "Star Trek: Deep Space 9," in room 011.
- On those rare occasions when they are able to drift outside Sitterson Hall, students have had a great time at a firing range ("Geeks With Guns I"). We meet every Friday night at 5:00 p.m. at He's Not Here for a TGIF celebration.
- A gathering was held after both Core Comprehensive Exam test days to "Politely Comment on the Test." About 20 students attended the chips and coke session in the Reading Room. Friday's session, held in conjunction with the TGIF, was very popular.

Sports

- The CSA sponsored an IM ultimate frisbee team and won. We also sponsored an IM Wimbledon volleyball team and came in 2nd in a heartbreaker. The CSA is also sponsoring IM soccer and volleyball teams.

CSA Teaching Awards

Jim Anderson, assistant professor, and **Steve Weiss**, professor, were the 1995 recipients of the new CSA Teaching Award! Every year the CSA will present this award to two professors for their excellence in teaching. Recipients are nominated by either students or faculty members, and are then chosen by a student committee. The committee considers comments in the CSA Department Review pages and other criteria. Recipients are limited to one award every two years. A plaque bearing the names of award recipients will be installed in the first floor lobby of Sitterson.

Computer Services news

New phone switch installed

In September, **David Musick**, network coordinator, and **Ken Weaver**, network manager, worked with Sprint Carolina Telephone to install a new Northern Telecom telephone switch. This switch replaces the Intecom switch which was installed when we moved into Sitterson in 1987. The new switch, which is about one sixth the size of the old one, provides the same voice and data functions but uses current technology, making its software and hardware much less expensive to maintain. In addition to handling voice and data communications, the new switch provides voice mail service for faculty and staff.



David Musick checks out the new phone switch (Photo by Li-Yun Yu)

New HP and SGI computers

Our SGI computer fleet more than doubled (from five to twelve) this fall. The new SGIs include desktop systems and very high-performance SGI Onyx systems. Most will be deployed in the Graphics and Image Lab. **Amy Kreiling**, systems programmer, worked with research groups to configure these systems. She is handling software installation and support. **Fred Jordan**, electronic shop supervisor, coordinated hardware support for the SGIs and will attend training to support the Onyx systems.

Research groups have ordered 13 new HP workstations which will be installed primarily in student offices. **Michael North**, systems administrator, is handling software support, while Fred and **Mike Stone**, electronics technician, are taking care of hardware installations. The purchase of these systems allows us to retire the last of our DEC 2100 computers, the slowest of our (still large) DEC fleet.

Macintosh system upgrades

Melanie Stecker, systems programmer, supervised the operating system upgrades of the Department's Macintosh fleet to system 7.5.1. Previously, our Macintoshes were running on a variety of different levels of the operating system, each of which had different features and bugs. The upgrade will help to simplify the administration of our largest computer fleet.

Network upgrade phase 1 complete

The first phase of our network upgrade plan is complete. **Ken Weaver** has installed a Cisco router to replace the old Wellfleet bridge. The new router is faster, more dependable, and uses modern technology.

Ken and his staff have installed three ethernet switches on the FDDI (fiber) backbone. These switches provide dedicated 10 megabit connections to the backbone. Research groups are being encouraged to include these switches in grant proposals; the dedicated pipes to the backbone will provide substantial performance increases for the machines using them.

The last part of phase 1 was the purchase of a network analyzer. This box, which is a PC with special network interfaces and software, allows us to track down problems, balance subnetwork traffic, and make plans based on hard data on network use. Later phases of the network plan will involve adding more ethernet switches, putting servers directly on the FDDI backbone, and adding ATM switches.

Building and grounds committee

A new Department committee--Building and Grounds--has been formed to discuss various needs for upgrading Sitterson Hall's facilities. **Vernon Chi, Katrina Coble, Henry Fuchs, Fred Jordan, Tim Quigg** (chair), and **Brian White** are the members. The idea for forming the committee came from **Tim Quigg**, who recognized that our building is an outstanding facility, but it will remain so only if we provide for its necessary care.

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