A Buckyball — a space-filling model of a molecule of buckminsterfullerene rendered in Spartan; see page 25.

A sketch figure animated in Scratch; see page 23.

A videotaped business conversation in Living Case; see page 5.

From the Director

Instructional Computing

Networks and Network Services

Social Science Computing

Microcomputers

Computing in the Humanities

Arts and Media

Science and Visualization

Supers, Mainframes, and Minis

Library Computing

Upcoming Events

Summer '93 at the ACF

Important Dates for ACF Users

ACF Tutorials

ACF Microcomputer Workshops

ACF Summer Calendar

A full table of contents is on the back cover.
Academic Computing and Networking at NYU is edited and published by New York University's Academic Computing Facility (ACF). Its scope includes information about computing and networking activities at NYU's various schools, departments, and administrative units.

Copies of Academic Computing and Networking at NYU are mailed to University faculty and staff and are also available from the ACF's Information Services Office (Room 306, Warren Weaver Hall). Students holding ACF individual computer accounts are included automatically in the newsletter's mailing list.

We welcome your comments and suggestions about the articles in this issue, and about articles for future issues of the newsletter. Contributions from sources within the University are invited for consideration by the Editor; please send E-mail to hochberg@acfcluster.nyu.edu or frederickson@acfcluster.nyu.edu or call 998-3038 for more information. Articles are written by members of the ACF staff, unless otherwise indicated.

Opinions expressed in the articles in this newsletter are those of the authors and not necessarily those of the Academic Computing Facility or of New York University.

Below many of the bylines in the newsletter are electronic mail (E-mail) addresses. If you do not use E-mail but would like to, see the box on page 33.

This issue was prepared on Apple Macintosh Quadra, IIci, and SE computers, using Aldus PageMaker, Microsoft Word, Adobe Type Manager, and Adobe Photoshop. Fonts used in this issue are Gill Sans and Adobe Garamond, along with Zapf Dingbats and Courier (for special effects). Camera-ready copy for this issue was produced using a 600-dpi QMS 1700 printer.

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Thanks also to Jeffrey Bary, Wan Chai (Interactive Telecommunications Program, TSOA), Gary Chapman, Catherine Fallon (Department of Photography, TSOA), Ahmed Farhadi (Near Eastern Languages and Literatures, FAS), Howard Fink, Ed Franceschini, Jac Fried, Bert Holland, Frank LoPresti, Larry Mingione, Henry Mullish, Rajesh Raichoudhry (Department of Computer Science, GSAS), Stephen Rittersporn, Gary Rosenblum, and Carmen Vasquez.
In 1988, with the help of EDUCOM, a group of academic networking experts began a series of annual conferences to discuss and improve the status of data networking for research and education. This series of meetings, starting with National Net '88, has provided a regular forum at which the academic community can take stock of the state of networking, the evolution of its underlying technologies, and the policy framework surrounding the deployment of this technology in the United States and around the world.

I've just returned from National Net '93, and I'd like to share some impressions with you of where we are today and where we may be going in the future.

National Policy Is Being Reappraised

First, U.S. national policy on support of research and education networking is undergoing a substantial reappraisal, and the telecommunications industry is itself in turmoil. Since 1985, the National Science Foundation (NSF) has played an active part in creating a network infrastructure for research and education by subsidizing investment and growth at the local, regional, and national levels. As network-transport technology becomes better understood, the NSF is increasingly moving toward a view that such services can and should be supplied by the private sector. In next month's resolicitation of national backbone services, the NSF is expected to argue that the backbone it supplies should be used only for specific network-oriented experimentation and access to supercomputer centers, and that the regional networks should make whatever arrangements they choose to communicate among themselves or with other networks.

As the huge demand for such services throughout our society becomes increasingly evident, AT&T and other companies in the private sector are taking an increasingly aggressive stance on this issue. The issue is confounded by the growing battle between the TV cable companies and the local telephone companies for rights to distribute information to the home. At stake, and at some risk, are the nature, shape, and usefulness of the emerging national information infrastructure, including the Clinton administration's proposed "national data highway."

Given this degree of uncertainty, how will the networking interests of the research and education community be protected? The promise of 500 channels of high-bandwidth information being delivered to every home is an empty one if 499 of these channels will be used to transmit mud-wrestling and grade-B movie reruns. The promise of 500 channels of high-bandwidth information being delivered to every home is an empty one if 499 of these channels will be used to transmit mud-wrestling and grade-B movie reruns.
6:00 to 8:00 ceases to transport our messages because it must inundate us with live reports of electronic auctions and appeals for funds so that the channel can continue to operate. How can we ensure that the variant of Gresham's law which has reduced much television programming to a lowest common denominator does not infect the substantial new bandwidth that is likely to interconnect our homes and offices? Clearly one necessary condition is that the commercial providers who control the delivery medium should not have any control over the content of what is being delivered. How should this separation be defined, and what are sufficient conditions for ensuring that a diversity of services can coexist and flourish in the new networking and telecommunications world?

It is increasingly clear that the national information infrastructure — including the current National Research and Education Network, which grew from NSFNet and is a large component of the Internet — will have to evolve toward a commercial, private structure if the infrastructure is to be truly useful in the long run. To the extent that ownership implies control, there is widespread doubt that at this time the private sector has the vision, the innovative capability, or the perception of user needs that is required to serve us well. The growth of the Internet to date has been a story of rapid innovation, taking place outside of the telecommunications industry, using only selected parts of industry-supplied infrastructure (such as raw transmission bandwidth), at a time when general telecommunications-industry offerings were unsuitable. The reluctance of the education community to trust its future connectivity to the industry has been nurtured by this history.

**The Internet's Domestic Growth: Double in One Year**

Second, against expectations, the Internet continues to grow at an increasing rate. Last year's reports of rapid growth—including a sustained rate of increase of traffic on the NSF backbone of 15 percent per month — led me to believe that such a rate was unsustainable. Evidence collected during the last year has proven me wrong. Both the number of networks and the number of hosts connected to the Internet have essentially doubled over the last year; there are over 10,000 separate networks that now comprise the Internet, and there are about 1.4 million hosts connected to all of those networks. Moreover, an additional 30,000 network numbers that have already been assigned could eventually connect to the network. The owners of some of these numbers no doubt want to keep their networks private and unconnected, but other numbers represent networks now being formed, with interconnection inevitable in the near future.

This situation of rapidly increasing demand has led to an ironic situation. Without a fundamental change in our network addressing conventions, we are in danger in the next two to five years of running out of network numbers, or address space. It is as if the demand for telephone lines were doubling every year, and even using all possible area-code combinations we were running out of telephone numbers to assign to new subscribers. This situation results from the Internet growing at a rate and to a level that its founders did not anticipate in their wildest dreams. The community's engineering body—the Internet Engineering Task Force
and several of its technical subcommittees in particular—is working on this problem now. We must find a solution to this problem or the growth of the Internet will soon reach its limits.

International Growth: Even Faster

Third, the international component of the Internet is growing even faster than the domestic part, and may exceed it in the future. The current situation, according to Larry Landweber of the University of Wisconsin (who tracks this area), is that 127 countries are connected together in such a way that their networks can exchange electronic mail. Within these countries, there are a variety of network protocols for exchanging information. In particular, 51 of these countries have networks on which the full range of TCP/IP protocols are available, allowing the most general kind of access to resources throughout the Internet. I now communicate with relative ease and speed with people in many foreign countries; such communication is likely to become a widespread reality in the years to come. Electronic mail is likely to eclipse the jet plane as a technology moving us toward the global village.

New Applications Demand Greater Bandwidth

Fourth, new applications continue to emerge that are likely to add yet another dimension of growth to the Internet. In one National Net '93 session, Internet Talk Radio was discussed, and the notion of an "audio server," used to obtain sound information, was discussed. One such server is in the process of being implemented, with historical audio clips as the subject matter of the server. In addition, two organizations were showing primitive desktop video-transmission and conferencing systems that used only slightly enhanced desktop microcomputer systems as the terminals and the Internet as the communications path between the microcomputers. Direct telephone connections at some intermediate bandwidth might be able to support such activities alone, but basing the transmission on microcomputers would allow all of the material available to all of the computers involved in the transmission or the conference to be transmitted as well, promising very substantial value added services in the near future.

Why Is the Network Important?

Why are these developments in networking so important? Why do I stress them so much in these columns and elsewhere? It's a good question and — given the increasing investments, in terms of both time and people, being devoted to networking on campuses today — it deserves an answer that justifies those investments.

One of the simplest and most eloquent statements explaining the importance of networking was formulated when BITNET was first created. The goal of BITNET, they said, was "to ensure that every scholar in the world has access to the work of every other scholar." For the founders of BITNET, access meant the relatively rapid access that the emerging store-and-forward electronic-mail technology was capable of supporting, as well as the ability to transmit in a cost-effective manner larger bodies of text (files) that already existed. While the original BITNET suite of services did not foresee interactive access to large collections of scholarly material (libraries), groups working on other protocol suites, including those used on the Internet, implemented this natural extension to the original BITNET concepts of access.

The Internet extended this paradigm of access by adding interactive communication with other types of knowledge. For example, it is possible today from any Internet node at NYU to gain access to and browse through hundreds of online library catalogs both in the United States and in other countries. Organizations wanting to make various bodies of information available are gravitating toward use of something called a Gopher server to provide this facility. (Gopher, a program written at the University of Minnesota, is named after the university's mascot, as well as the universal flunky.) Many universities have begun to construct Gopher-
based campus information systems that provide up-to-date, online information about their universities and their surroundings for use of their communities of students, faculty, and staff.

Relevant examples are not hard to find. In January, the White House announced several electronic-mail addresses for the president, and it established an electronic archive for the posting of all kinds of policy statements made by the administration. Within hours of a statement coming out of the White House, the electronic text is now posted in this archive. If you have access to the Internet at NYU, you can retrieve these statements rapidly and easily. In mid-April, The Chronicle of Higher Education launched a Gopher server for its electronic version of the Chronicle, including computer-searchable news features and classified advertising. A commercial service, now offering interactive access to the contents of the Federal Register over the Internet, has recently reduced its prices drastically. Every week, announcements of impending or actual new Internet-based services are broadcast through the electronic media and in print; many are available free either on a trial basis or indefinitely.

**A Broader Network Goal**

The BITNET goal of connecting all scholars in the world is now widely regarded as being a narrow one, and interconnection of the entire scholarly community, including students, is regarded as its successor. Students are increasingly accessing remote instructional resources and using network tools in support of instruction. For example, the use of electronic mail between instructors and students is growing. The Information Technologies Program at NYU's School of Continuing Education is experimenting with Lotus Notes as a way of unifying the instructional program of a class whose members are all remotely located.

Interest in the benefits potentially available through the network is now widespread in both secondary and primary schools. Patterns of connectivity are currently quite irregular, and both levels and effectiveness of usage are difficult to determine. For example, all secondary schools in the state of Texas are connected. Boulder, Colorado, is undergoing a period of active deployment of network connections and use in all of their K-12 schools. The NSF has earmarked an increasing amount of money for supporting network extensions and experiments in network exploitation in the K-12 community.

NYU and NYSERNet (New York State Education and Research Network, of which we are founding members) are involved in one such project in the New York City area, helping a specific set of school districts and schools to understand networks, introduce them in schools, and use them to enhance and enrich their curricula. This is time-consuming work, and is a major task considering the sheer numbers of schools, teachers, and students at these educational levels. Nevertheless, we are helping to start the process (see the article on page 9).

The academic computing and networking activities of any one university — and indeed, of the aggregate of all institutions of higher education in the world — depend critically both upon the technical innovation and developments of the computing and communications industries and upon the public policy that we create in the United States to guide and direct it. During the next several years, fundamental decisions will be made that will substantially affect our future in these areas. All of us have a significant stake in the outcome; let's observe the process closely and be ready to state and defend our collective interests.
New Courseware from the Stern School

Living Case: Making Business Problems Fun

by Jon A. Turner
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Jon A. Turner is Director of the Center for Research on Information Systems and Associate Professor of Information Systems at the Stern School of Business.

Multimedia courseware now being developed at NYU’s Center for Research on Information Systems (Stern) brings computer sound and action to the traditional case method of instruction. And by incorporating spreadsheets, databases, and a nonlinear organization, it gives a more realistic environment for a student’s investigation of a case.

The Traditional Case Method

The case method of instruction is fundamental to teaching in business and other professional disciplines, such as law. A case is a description of an actual business situation — deciding whether or not to launch a new product, for example — written after the fact by an investigator. Cases are usually eight to ten pages long, and include descriptive text, quotations, tables, and graphs.

Cases are used in two ways: by students to learn to recognize, diagnose, and solve problems, and by instructors to illustrate concepts and principles through discussion in class. Students prepare for class by reading and analyzing a case, sometimes writing up their recommendations. One important objective in case instruction is to develop reasoning skills by learning techniques of information identification and interpretation.

A drawback of the current method for presenting cases is the structure imposed by the investigator — the sequence and selection of information contained in the case. Rather than learning to uncover and interpret information on their own, students recognize cues related to the presentation — for instance, they learn to assume that if the firm president says something, it must be important. And written cases, because of their limited size, are not difficult to understand. In real organizations, the challenge is to make sense of all the information available — seeing patterns, creating interpretations, assigning meanings to data fragments, predicting the future, forming hypotheses about likely causes of events, and filtering out the irrelevant. This takes different skills than those needed for analyzing a written case.

Another limitation is that unlike real organizational situations, cases are static; they do not change as a result of actions taken by a student. Normally, though, what one does determines, to some extent, what one sees. Additionally, organizational settings provide an array of different types of information — decor, sound, pulse, personal appearance, and behavior — that cannot be captured easily in writing. The technologies of multimedia, computer simulation, and artificial intelligence now bring computer sound and action to the traditional case method of instruction.

A Living Case screen, left, shows information icons on the right with the correspondence icon open. The student can step forward or backward through the case file using the buttons at the bottom of the screen. Here, a video window has been launched using a button (link) in the text. The coffee cup icon brings up a chance encounter at the coffee pot — a rich source of hints for further investigation.
intelligence provide ways to create more realistic and interesting environments for student exploration. This is the notion behind *Living Case*, an intelligent instructional project being developed at the Stern School.

**Cases in Multimedia**

*Living Case* consists of three parts: a delivery system that students use and interact with, an authoring system to aid the investigator in constructing a case (the courseware), and a modeling system that interprets student behavior and provides customized feedback. It features video clips, hypermedia links for nonsequential exploration of material, and spreadsheet models that can be launched from within the system. The delivery system was developed under MS Windows on the PC and is now being adapted for the Macintosh (see box above for details).

An unusual aspect of *Living Case* is the way the courseware was constructed. Unlike traditional cases, which are written after the fact, *Living Case* was composed as events unfolded. One of our project members spent three months as an observer in a firm while a replacement system for their historical personnel records was developed. This approach permitted gathering a web of related information, in various forms, which was used to populate our "active" case. Some of these materials are text objects (mostly correspondence and reports) to be discovered by the user exploring the case. Others are scripts written to recreate meetings and incidents, which were later videotaped. The audio and video were transferred to a video disk. Soon, it should be possible to have all the materials associated with a case — except the delivery system itself — on a CD-ROM.

The authoring system is a repository of objects that maintains each object with relevant information about media type, format, content, relationship to other objects, and length of presentation. These objects can be viewed, edited, associated, sequenced, and entered into various office files for browsing through the delivery system. The authoring system also contains rules for, and information about, case construction. As part of that process, a data structure is built to represent case contents at various levels: learning goals, domain concepts, and objects.

Student behavior is monitored by the modeling system: the student’s actions with the delivery system are aggregated, and are interpreted by comparing them to a set of generic activities and the domain-specific data structure; the user is periodically given hints and other feedback.

**Testing and Research**

While portions of the system have been tested, full student use and evaluation await the construction of a second active case, and the installation of workstations with sufficient storage for the video portion of the system. *Living Case* makes a good environment for studying such wide-ranging areas as human-computer interaction, machine interface design, problems in managing complexity and in navigation, human learning and decision-making, and collaborative work and communication. Additionally, the system has the potential to provide insights on how students use information to recognize problems and how they learn business principles. We may be able to understand better what differentiates good students from bad in case analysis.

The system has the further potential to permit students located remotely to work together. But most important, *Living Case* can make investigating business situations interesting, challenging, and fun.

*Living Case* was designed by the author; Michael Benaroch, who is at Syracuse University; Rachna Kumar, now at the University of Texas, Austin; and two Ph.D. candidates in Information Systems at the Stern School of Business, Raghav Madhavan and Terry Finch. Filming was done by Marianne Petit from the Interactive Telecommunications Program (TSOA). Funding in part was provided by an NYU Challenge grant.
Few students — and not many teachers — like language drills, though most parties agree that they’re necessary. Professor Dilworth Parkinson of Brigham Young University would prefer to spend class time on matters more interesting than vocabulary drills and verb conjugations, so he wondered if computers might be able to take over some of the more repetitious tasks, and even make them relatively painless for students, if not downright fun.

**Computer-Aided Language Drills**

At an NYU colloquium on innovative uses of computers in higher education on March 26, Professor Parkinson presented a suite of Macintosh-based teaching modules he has devised and used in his Arabic courses at BYU. Organized as HyperCard “stacks,” these programs provide ready-to-use interactive instruction in Arabic. Since the programs are based on HyperCard, it is easy for a person with no knowledge of formal computer programming to add new material — lessons, vocabulary drills, pictures, recorded pronunciations, or whatever. The same basic structures could readily be adapted for instruction in other languages.

Professor Parkinson calls his program *MSA HyperCard*; it is based on the Modern Standard Arabic series of textbooks. The suite includes modules for teaching the alphabet and grammar; for drill in vocabulary, texts, and voweling; and for listening comprehension.

Vocabulary lists, for instance, are drilled six or seven different ways — translation from Arabic and to Arabic, fill-in-the-blank cloze drills (the student can choose whether to have one, two, or three blanks to fill in each sentence), and so on. The student can read Koranic suras, meanwhile listening to recordings of the same texts being either read or chanted.

**Making Sure the Programs Work**

Why, Professor Parkinson asked, do such relatively unsophisticated programs succeed in helping students to master a language, especially when more sophisticated bells-and-whistles programs often fail? He listed several reasons, including the following:
• The programs are fully integrated into the course, since their material can be written or modified to reflect the texts and exercises used in class.
• They stay within the evident limitations of the machines. Computers aren’t people and aren’t perfect; the programs may sometimes not recognize a right answer (one of several alternative translations of a word or phrase, for instance). Students should be encouraged to accept the limitations and not be frustrated by them.
• The programs demand active participation from students, not just passive clicking of a mouse button to go to the next frame. They must type words and phrases, they should pronounce words, they need to select or type proper words to fill blanks, and so on.

**Computer Access for People with Disabilities**

If you need information on how to provide the appropriate, mandated computing services for students, faculty, and staff with disabilities, EDUCOM’s EASI (Equal Access to Software and Information) Seminar Series has answers. The series is designed to offer strategies for developing and enhancing adaptive computer-technology services on university campuses. Separate modules focus on:

- Laws such as the Americans with Disabilities Act.
- Technology and equipment necessary for disabled people.
- How to set up accessible labs and workstations.
- Services necessary to support adaptive-technology use.
- Strategies to help secure administrative support and funding for services.

For more information on the EASI Seminar Series, send E-mail to csmiicl@mvss.oac.ucla.edu or call (310) 640-3193.

Project EASI has also started two new discussion groups to address aspects of information access:

- The EASI library group’s electronic discussion list deals with topics related to making libraries and information accessible to individuals with disabilities. For more information, please contact Dick Banks at rbanks@uwstout.edu.
- The EASI E-text group is discussing methods of providing access to machine-readable text. Discussion topics include the use of Standard Generalized Markup Language (SGML) to provide a basis for accommodation and work being done by the Text Encoding Initiative, the International Committee for Accessible Document Design, and publishers. For information, please contact Richard Jones at icrrf@asuvm.inre.asu.edu.

EDUCOM is a nonprofit consortium of colleges, universities, and corporate associates founded to provide a forum for the exchange of ideas on critical issues related to computing in higher education.

— David White,
from material in EUITNEWS

• The programs can record each student’s usage — the amount of time spent on the computer, the choices made, the answers offered — so the teacher can readily monitor the student’s progress and make suggestions for more effective use of the facilities. (Most students seem to learn within a couple of weeks, after which such close monitoring is not needed.)

MSA HyperCard is now being used here at NYU by Prof. Ahmed Ferhadi, who is adding more lessons from the textbooks to the basic set. (See his report in the January 1993 issue of this newsletter.)

This colloquium, part of an ongoing series presented by the Academic Computing Facility and the Faculty of Arts and Science with support from Apple Computer, Inc., was co-sponsored by the FAS Departments of Linguistics and of Near Eastern Languages and Literatures, the Kevorkian Center for Near Eastern Studies, and the program in Intercultural Education (Department of Teaching and Learning, SEHNAP).

**Other Colloquia and Technical Seminars**

Later events in the series this spring focused on different areas of interest to scholars and researchers, and will be reported on more completely in the September newsletter.

On April 9, Professor J. Robert Cooke presented two Macintosh-based programs that he has been developing with others at Cornell. DiscoverPro is a flexible bibliographic database that allows a scholar to maintain files of citations, including pointers to other databases where the cited materials are actually stored. MathWriter is a scientific wordprocessor whose strong formula-writing capabilities can easily be controlled with a mouse through pull-down menus.

At the final colloquium of the series on April 23, Professor Michael F. Goodchild of the National Center for Geographic Information and Analysis reported on current explorations and research in GIS (geographic information systems; see article on page 13). More colloquia are planned for the coming academic year; for details, see the September issue of this newsletter.
The Internet in Education

Extending the Network to the Schools of New York City

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Bonnie Brownstein is the founder and president of the Institute for Schools of the Future.

Darryl, a second-grader at PS 287 in Brooklyn, reads a book every week. He's about to get a "book buddy" at PS 46, another school in Community School District 13, with whom he'll exchange weekly book reviews and comments — by electronic mail. The speed and ease of the computer for E-mail — zipping through the ACF cluster of VAX/VMS computers at NYU in a split second — should make this an exciting correspondence.

Josie, a sixth-grader at PS 46, is participating in a project called "Networking Women Teachers, Their Students, and Scientists." Besides the customary activities — science-club meetings and Saturday field trips — the students and their teachers log onto the ACFcluster to exchange E-mail relating to their projects and explore the Internet. Josie has found CPSNet (Chicago Public Schools Network), where she practices her division with one of their arithmetic games.

Teachers all over the five boroughs are starting to exchange information and ideas by means of electronic mail, discussion lists (see box on the next page), and network news. Sitting in their own classrooms, they can look up books in the New York Public Library catalog, find the text of recent testimony before Congress, or set up pen-pal programs for their students with classrooms worldwide. They can also discuss classroom problems and solutions with teachers around the country, at times of their own choosing, without ever having to schedule a meeting.

NYC Connect
These activities are a part of NYC Connect, an umbrella project whose goal is to bring computer networking into the schools by helping schools and districts think through the issues of connectivity design and curriculum implementation. NYC Connect is a joint initiative of NYU's Academic Computing Facility, NYSERNet (the New York State Education and Research Network), and the Institute for Schools of the Future, working in collaboration with teachers, students, and supervisors of the New York City public schools.
schools in addition to some of the independent schools.

Recently, with funds from a National Science Foundation grant to NYSERNet, the ACF hired Beth Kevles to work on the project as the NYU coordinator of the New York City Educational Internetworking Project; she will be doing everything from teaching classes on how to read network news, to answering questions about how to use E-mail, to designing new ways for teachers and students to use the Internet for education.

Besides providing the present funding, NYSERNet has subsidized the various pilot designs by supporting telephone lines in classrooms, libraries, and labs. The Institute for Schools of the Future has dealt with the New York City school administration, and set up projects in schools, and provided an educational framework to make the whole project attractive to schools that are constantly strapped for time and money. Its president, Dr. Bonnie Brownstein (brownstein@acfccluster.nyu.edu), has long been involved in programs to help teachers and students in primary and secondary schools work with scientists and take advantage of the resources of the scientific community. She and her associate Keri Galuskin (galuskin@acfccluster.nyu.edu), also of the Institute, have been working with school superintendents, principals, and teachers in designing and implementing NYC Connect.

Volunteers Needed for Project NYC Connect
Would you like to work with students or teachers in the public schools? Perhaps you can help maintain computer equipment in one classroom, or maybe you’d like to help an entire classroom learn to use electronic mail.

If you’re interested in these or any related volunteer opportunities, if you would like to set up an internship, or if you would like to set up a research project for your students, contact Beth Kevles by e-mail at kevles@nyu.edu or by phone at 998-3029.

Discussion Lists and Electronic Conferences
Electronic conferences allow scholars at universities around the world to exchange information and views quickly and conveniently via international networks and electronic mail. A list of currently available mailing lists can be obtained by sending an e-mail message to mail-server@nisc.sri.com with the command send netinfo/interest-groups as the only line of the message.

Users of the ACF’s UNIX, VAX/VMS, and VM/CMS computers — and holders of the ACF’s Electronic Mail Accounts — can subscribe to electronic conferences and discussion lists by sending an E-mail message containing only the command

```
subscribe list_name your_name
```

replacing list_name with the appropriate list name (e.g., acsoft-1) and your_name with your first and last name — for example,

```
subscribe acsoft-1 mary smith
```

Send the message to the “subscription address” listed in the article. If you are using an Electronic Mail Account or a regular account on the ACF cluster of VAX/VMS computers, use the address format shown below under “VMS.” Address formats for UNIX and CMS systems are also shown. POP (post office protocol) mailers — programs that handle E-mail on microcomputers, such as Eudora for the Macintosh and NUPOP for the IBM-type PC — use a simple address form.

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<tr>
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You will receive an E-mail acceptance of your subscription, which will include instructions for unsubscribing. Be sure to save that information, or you may find it hard to get off the list. Then sit back and wait for your messages to start arriving.
New Local Dialup Access to NYU-NET for Users in Nassau County

For people in the NYU community who live in Nassau County, access to NYU-NET and ACF shared machine computer services is now only a local telephone call away. A new dialup number to the Internet is available in Garden City to those with accounts on PSINet, run by Performance Systems International (PSI). These accounts are available free of charge to all NYU faculty, staff, and students — one of the services provided through NYU’s affiliation with NYSERnet (New York State Education and Research Network). Account holders can dial the closest PSINet point-of-presence (POP), and after entering their access codes and passwords, connect to any shared machine (such as the ACFcluster, ACF2, and ACF4) at NYU. Remote users of NYU machines will be able to take advantage of many standard services such as connecting to the ACFcluster, E-mail and Information Services Accounts, and BobCat (the online catalog of NYU Libraries). PSINet’s new number in Garden City, (516) 222-6830, supports individual dialup service at 1200 and 2400 bps (bits per second). Faster connections are available for a small fee; contact PSI directly for more information.

PSI is the nation’s largest provider of com-

(continued on page 14)
The Federal Register via the Internet
A new commercial service, offering Internet access to the U.S. Federal Register, has recently been announced. The service enables individuals to connect via the Internet to a Gopher server, and to browse, search, and retrieve the full text of any article printed in the Federal Register. Articles appear the same day that the Government Printing Office makes them available in electronic format for paper printing.

The ACF is considering obtaining a trial, multi-user subscription to this service in the fall '93 semester. Faculty members who think that they or their students might be interested in exploring this service should contact Jeffrey Bary at the ACF (998-3049).

The Federal Register is the continually published record of new regulations that have been proposed or newly established by the many departments and agencies of the federal government, in their implementation of laws enacted by Congress.

While the Federal Register is available online through a number of other commercial services, the one being considered by the ACF is comparatively economical and offers the “user-friendly” menu-driven Gopher interface developed at the University of Minnesota, along with powerful WAIS search-and-retrieval capabilities. WAIS (Wide Area Information Server), which enables flexible searches of information on remote, networked computers, was developed by Brewster Kahle, then at Thinking Machines Corporation. More about the trial subscription to the Internet-accessible Federal Register service, and about Gopher and WAIS, will appear in an upcoming issue of this newsletter.

—Estelle Hochberg
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NYSERNet Wins Prestigious Grant
In March, NYSERNet, the New York State Education and Research Network, secured an “Apple Library of Tomorrow” (ALOT) grant from Apple Computer, Inc., to help with its Project GAIN.

The Apple Library of Tomorrow program makes equipment and software grants to libraries and other institutions that have innovative projects for the archiving and dissemination of information. These organizations include rural school and public libraries, state library agencies, special libraries, museums, rare-manuscript centers, nonprofit organizations, and consortia of different institutions.

NYSERNet — working with the J. M. Kaplan Fund of New York, Syracuse University, and a small group of upstate rural public libraries — is developing Project GAIN, the Global Access Information Network. The rural libraries will help develop a broad community of network users using NYSERNet’s infrastructure. Syracuse University will study the impact and produce a report showing how a community might replicate this project. Additionally, a CD-ROM and videotape will be produced containing network resources, QuickTime movies of Internet voyages, and network demonstrations. For more information on Project GAIN, contact Jean Armour Polly of NYSERNet at (315) 443-4120.

New History Network
Historians around the world have formed a new organization to facilitate the use of the Internet in their work. The founders hope that the organization, called the History Network, will expand to support a large variety of specialized lists. For more information, contact Richard Jensen, who handles education and recruitment for the History Network, by E-mail at u08946@uicvm.bitnet. More on the History Network will appear in a future issue of this newsletter.

Apple Warranty Service Now Provided Free Worldwide
Members of the NYU community heading for foreign points will be happy to know that Apple Computer, Inc., has extended the reach of its normal one-year limited warranty to cover systems of customers who travel abroad. Warranties for all Apple products, no matter where they were purchased, will now be honored by any Apple Authorized Service Provider in the world.

U.S. customers can travel with their Apple systems knowing they can now get service under an existing warranty without having to pay for the service first and wait for reimbursement. Customers from outside the United States can expect comparable service here. This global warranty umbrella automatically covers any Apple product within warranty. To receive the free warranty repairs, though, they will have to present their proof of purchase at the carry-in service center.

12 — May 1993 — Academic Computing and Networking at NYU
SA/GIS Sees ARC/INFO

Interest in Spatial Analysis and Geographic Information Systems Continues to Grow

by Zvia Segal Naphtali
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Robert A. Burnham is Professor of Educational Administration, SEHNAP.

W ell-attended recent meetings and a busy future schedule indicate that an increasing number of NYU faculty and students are delving into geographic information systems (GIS) for application in their professional fields. Two groups with a focus on GIS — the NYU Spatial Analysis and Geographic Information System group (SA/GIS) and a special-interest group of NYPC (New York PC User Group) — co­sponsored a pair of recent meetings, and a third one was scheduled for April 26, 1993.

ARC/INFO Presentations

Julio Olimpio, the regional director of the Environmental Systems Research Institute (ESRI), was the featured guest at meetings on February 22 and March 29. ESRI is the developer and publisher of ARC/INFO, which has become an industry leader for integrated software for spatial analysis and modeling. ESRI has developed a product line that ranges from ARC/INFO, which runs on sophisticated workstations on the high end, to the midrange applications such as ArcCAD and PCARC/INFO for high­capacity microcomputers, and to ArcView for Windows, which permits analysis of geographic data at the desktop level. ESRI's publishing program, ArcData, provides all kinds of data sets in the form of map files, satellite imagery, and aerial photos.

Multi-user configurations can be built around ARC/INFO via a file-server version that permits microcomputers — whether IBM-compatible PCs, Macintoshes, or DECs — running ArcView to query the host database for easy-to-use display and analysis. ARC/INFO employs or supports AutoCAD, Oracle, X Windows, and other graphic and interface tools to facilitate creation and display of maps, and automated display and querying of data, both statistical and spatial.

ARC/INFO's powerful ability to represent and combine continuous surfaces was demonstrated in an analysis of water drainage over complex terrain in watershed analysis. Another example demonstrated how a fire­growth model could be built, in which iterations correspond to steps in time. At each iteration, the effects of factors such as wind speed, wind direction, and fire intensity can be taken into account using rules written in ARC/INFO's GRID modeling language.

The Uses of GIS

Different industries find GIS useful for relatively direct application. For example, in managed health care, one insurance company maintains a geographic database on the location of thousands of physicians and hospitals that provide services to its corporate members and their employees. Then, geographic relationships can be displayed to
show where services are available to a prospective corporate client seeking health care for its employees.

Also, spatial analysis of complex information is vastly improved using the 3D modeling built into applications like ARC/INFO. Data can be arrayed on an X,Y matrix, and variables entered into cells on the matrix can be used to depict contour intervals similar to topographical elevations. Contoured surfaces can be colored and shaded to represent several variables or intervals. Cost surfaces, as in input-output analysis, may be purely representational — a three-dimensional graph — or may be placed on a geographically accurate map, as in analyzing real-estate property values.

More sophisticated, high-end systems like ARC/INFO give new meaning to GIS. For decision-makers suffering from information overload, the ability to assemble, integrate, and display information in a geographic format may lead to more effective analyses and decisions. A multi-user system makes it possible for specialists to analyze different aspects of complex problems and combine their analyses into decision maps, either conceptual or geographic, to support executives and policy-makers in their decisions.

Other Meetings
At the April 26 meeting, too late to report on for this issue, Mr. Charles Sharp of Strategic Mapping, Inc., was scheduled to present some new applications that were developed using ATLAS*GIS. This was the first opportunity at NYU to preview parts of the MS Windows version of ATLAS*GIS; the DOS-based version is currently available in the ACF's IBM-equipped labs.

SA/GIS meetings are held from 6:10 to 8:30 pm in the ACF Conference Room (Room 313), Warren Weaver Hall.

The ACF is looking into purchasing ARC/INFO for use by members of the NYU community. If you would be interested in using it, or want to learn more details, please contact Ed Friedman at friedman@acfduster.nyu.edu or at 998-3051.

At an NYU colloquium on April 23, Professor Michael F. Goodchild of the National Center for Geographic Information and Analysis (University of California at Santa Barbara) spoke on "Geographic Information Systems: Explorations and Research." Due to our production schedule, we will not be able to report on this colloquium until the September issue of the newsletter.
Virus Alert

Disinfect Your Hard Drive for Trouble-Free Computing This Summer

by David Frederickson
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Among the mixed blessings of the computer age is the virus — a tiny program that can enter your computer, usually on a borrowed floppy, and replicate itself. It may be more or less harmless — an ambulance running across the bottom of the screen, for instance — or it may corrupt your files by rewriting parts of directories and files, or cause your system to crash.

A new and malicious Macintosh virus has surfaced, set to go off on Friday the Thirteenth (this year, that means August). This new virus, called INIT M, can cause serious damage by changing the names of files and folders to random strings of characters, and changing their date of creation to Jan. 1, 1904. The virus spreads and attacks on System 7 and later, but fortunately not earlier Mac operating systems.

Antivirus Software

There are various antivirus programs, both shareware and commercial, that will scan your hard and floppy disks for resident viruses; those programs will also try to prevent new viruses from infecting your machine. The programs must, however, be

(continued on page 16)
The Academic Computing Facility distributes several software packages from its Faculty Microcomputer Lab under site licenses at substantially discounted prices.

Recently, ACF's license agreement with SPSS was modified to include the Windows version of SPSS for MS-DOS microcomputers. SPSS for Windows enhances an already powerful statistical analysis and data management system with a graphical user interface and the ease of pointing and clicking the mouse. Users operate the package through simple menus and dialog boxes.

The minimum system configuration required for SPSS for Windows includes:
- DOS 3.1 or later
- Windows 3.0 or later
- 80286 processor or better
- 4 megabytes of RAM
- Hard drive with 15 megabytes free memory
- Graphics adapter with 640 x 350 resolution (EGA) or better

The SPSS component package includes the Base Module, ProStats Module, Advanced Statistics Module, Tables Module, and, in the DOS version only, a Data Entry Module.

To Use SPSS

To obtain a copy of SPSS, in either the DOS or Windows version, arrange an appointment with the staff of the Lab, Room 312, Warren Weaver Hall, 998-3044. The cost is $295 for the Windows version (with an annual license-renewal fee of $95) and $195 for the DOS version ($75 annual renewal). Individuals may pay with a personal check; departmental purchases can be paid via a transfer of funds. The software is copied from a master disk to the purchaser's own diskettes; please bring 10 DS/HD (double-sided, high-density) disks for the Windows version or 9 disks for the DOS version.

Disinfect Your Hard Drive (continued from page 15)
updated for new types of virus as they appear. Two anti-viral programs—F-PROT 2.08 for the PC, and Disinfectant 3.2 for the Macintosh—are available free of charge at the ACF. Disinfectant 3.2 has been updated to take care of INIT-M.

To download either program, use Kermit to connect to the ACF INFOsystem (go to INFO and access the Downloads section; retrieve the file you need from the Mac or MSDOS directory) or use anonymous FTP from the ACF cluster. Alternatively, bring a formatted diskette to the ACF Faculty Microcomputer Lab (Warren Weaver Hall, room 312, noon to 8:00 pm) for a copy of either program.
Electronic Texts:
A Promise for Humanities Research

by Kurt De Belder
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Kurt De Belder, Western European Literatures and Languages Librarian at Bobst Library, is a member of the Library’s Task Force on Electronic Texts.

Scholars in the humanities often create and work with electronic texts, and have come to appreciate many of the possibilities inherent in machine-readable text. But the impact of these possibilities has largely been restricted to what I would call the “procedural” side of the humanist’s labor:

- The mutability of electronic texts (e-texts) is utilized only in editing and recycling texts.
- The reproducibility of machine-readable texts is used mainly to transform them into print format.
- The ease of transmission of e-texts across electronic networks is used for only minimal dissemination.
- The wide array of search possibilities has been limited mainly to citation and lookup queries. This reductionist, procedural, model has retarded the use of machine-readable texts in the “creative” or “intellectual” realm — the humanist’s ultimate domain of textual analysis and interpretation.

Of course, a computer cannot process “information” that is not explicitly considered or excluded — unless it refers to an electronic thesaurus, it cannot recognize the word beautiful as a synonym of the word lovely. Secondly and more importantly, computers have little tolerance for ambiguity. The subtleties of a concept, a metaphor, or an image need to be translated into the rigid confinement of a one-dimensional word. In the area of computer-aided textual analysis, this apparent inability to deal with the implicit and the ambiguous has prevented some of the distinct advantages of computing from permeating into the humanist’s intellectual realm.

Much text-directed computer research has been marked by these inadequacies — often negatively, resulting in quantitative number-crunching and statistical analyses, but sometimes positively, using the computer’s computational strengths to facilitate or underpin interpretative statements. Michael Riffaterre studied the repetition of verbal mannerisms in Gobineau’s Pléiades, such as assurément, sans doute, and soit (Le Style des Pléiades de Gobineau, New York, 1957). His conclusions, made possible and supported by computerized stylistic analysis, went beyond statistical banalities and recognized Gobineau’s tic words as “linguistics tips of a psychological iceberg revelatory of the deep currents of thoughts, of the major ideas, and even of the idées fixes of the author, [which] can help us understand his conscious choices.” Another worthwhile piece of research is the authorship study of Mosteller and Wallace on the disputed papers in The Federalist (Inference and Disputed Authorship: The Federalist, Reading, 1964). In this study, the occurrence of specific words in the attributed papers and in the twelve disputed...
papers helped lead to the conclusion that Madison wrote the disputed papers.

But the overall record, after almost 40 years of text-directed computing, is rather disappointing. Many of the past studies have failed "to produce results of sufficient interest, rigor and appeal to attract a following among scholars who do not make extensive use of computers." There are three reasons for this. First of all, the problems of ambiguity and explicitness have not been adequately resolved. Secondly, many humanities-computing specialists have failed to focus on how text-directed computing could help the analytical and interpretive process, or even might change the type of questions a scholar would ask from the text — in other words, a lot of humanities computing has been done for its own sake. And finally, humanities-computing specialists have not developed their own theoretical framework, nor tried to link the new possibilities of text-directed computing to some of the theoretical concerns of humanities scholars.

Recent discussion and evolutions in the areas of text-directed computing and encoding of texts might offer us indications in resolving these problems.

Mark Olsen has proposed a way to link the strengths of text-directed computing with theoretical concerns. In the Humanist electronic conference (see box below), Olsen wrote, "The corrective is to engage and exploit the developments in critical theory head on. Indeed, it is my firm belief that the technology allows us to rethink the notion of 'textuality' and the relationship of text to context (discursive, social, and political). And provide solid, verifiable results based on new theoretical models, allowing us to test and (hopefully) improve critical theory. Humanities computing should be in the lead of rethinking textuality precisely because the technology allows us to treat text as a radically different object of research." One way to derive more convincing results might be to study issues like intertextuality, through the analysis of a broad body of texts, rather than to concentrate on the individual text. Olsen pointed out the failure of computer-aided literature studies "results from past concentration on in-depth studies of individual texts or authors, studies seeking to identify subtle semantic or grammatical structures, precisely the areas in which computer processing is the weakest."

Certain databases like ARTFL (American and French Research on the Treasury of the French Language), which can provide simultaneous access to a large corpus of texts, could be instruments for this type of research. Consider the work of Keith Baker: for his book Inventing the French Revolution (Cambridge, 1990), he used the ARTFL database to study the idea of "public opinion." ARTFL, he states, "was enormously useful in identifying occurrences of opinion publique in the database for further analysis, in suggesting a tentative chronology for the usage of the term in eighteenth-century France, and in illustrating the traditional associations of opinion with uncertainty, instability, and disorder - associations that were rapidly changed when mere opinion was transformed (as it was during the third quarter of the eighteenth century) into the rational authority of opinion publique, the new tribunal to which all political actors were compelled to appeal."
To claim a preference for analyzing a corpus of texts while abandoning the individual text might be an interesting tactical retreat, and it could produce worthwhile results and partially fill the present theoretical void. On the other hand, it evades the pervasive problem of ambiguity and explicitness, which becomes most apparent in the computer-aided analysis of individual texts. Attempts to analyze individual texts rigorously through ARTFL will not be very successful, since the database does not accommodate the separation of text from search program, thus restricting the analysis to the limited possibilities of the program and making it quite impossible for scholars to manipulate the text in meaningful ways (for instance, by incorporating data that could increase the searchability of the text and yield more complex output — additions known as “markup,” discussed below). Even a new version of PhiloLogic (the search program for ARTFL) will not really improve matters in this area. Nonetheless, to abandon the individual text as a legitimate object for computer-aided analysis would be a costly capitulation — could cause humanists to retreat entirely from text-directed computing.

Recent developments in the area of markup or encoding could prove to be very fruitful for computer-aided textual analysis of both single texts and bodies of texts. Markup is the addition of extratextual elements to an electronic text. A formalized markup language provides conventions that identify markup, regulate its usage, and allow it to be distinguished from the text itself. In the area of text-directed computing, markup could, to some degree, compensate for the inadequacies of computers. Willard McCorry distinguishes two types of text directed computing: “Blind” computing is an exploration of a text with information from extratextual input — in other words, an algorithmic approach such as ARTFL. “Catoptric” computing, in contrast, is the close, recursive examination of a text that is significantly and increasingly enriched by the user’s ideas — in other words, a metatextual approach which requires tagging or markup. Markup would allow the scholar to enrich the text with information that could be used to analyze the text with greater subtlety and ambiguity. Tagging would be a process of the human mind (I tag, therefore I think). This would not, however, completely solve the problem of “disambiguation,” since distinctions and choices would still need to be made; but these would be human factors that typify thinking, and not a computer-driven compulsion to disambiguate.

Past encoding schemes and markup languages have often reflected the research interests of their originators, confined to only one subject area and one applications program. This diversity in encoding schemes, of course, prevents the diachronic type of textual research described above, since the encodings of different e-texts would be incompatible. Since 1987, however, the Text Encoding Initiative (TEI; see box on page 17) has adopted a common interchange standard for encoding machine-readable texts: the Standard Generalized Markup Language (SGML, set forth as ISO 8879). Within the syntactic framework of SGML, an encoding scheme can be designed that can handle all the intellectual problems a scholar might want to encode. Furthermore, SGML’s Document Type Definition (DTD) allows for the internal validation and consistency of the encoding tags; the TEI header that precedes the SGML encoded transcription of the text satisfies the need of the scholar to have exact information about the
A printout of the beginning of an encoded text of Baudelaire's "Hymne à la Beauté."

Each element is enclosed in a pair of markers, each consisting of the key word or phrase enclosed in angled brackets; in the closing marker, the word is preceded by a slash.

A printout of the beginning of an encoded text of Baudelaire's "Hymne à la Beauté."

Each element is enclosed in a pair of markers, each consisting of the key word or phrase enclosed in angled brackets; in the closing marker, the word is preceded by a slash.

data, its source, and its markup. Specifics are included on
- The file description: title of the file; the funding sources; names of those who captured, encoded, and validated the e-text.
- The source that was used to create the e-text: bibliographic information such as author, title, editor, and imprint.
- The encoding particulars.
- Any revisions by the original encoder or succeeding encoders of the e-text.

The groundwork that has been laid with the TEI will allow scholars like Mark Olsen to explore issues of intertextuality in a corpus of multiple texts, as it allows Willard McCarty to proceed with his "catoptric" analysis — which could become a cumulative and collaborative effort. The TEI will prove to be essential for the production of high-quality electronic texts that will withstand scholarly scrutiny. Since many electronic texts are created, directly or indirectly, for the commercial market, it is of vital importance that scholars and librarians demand that commercial considerations not dilute the high standards of textual and critical editing that can be provided through TEI-conformant electronic texts.

Scholars will then be able to enjoy all the advantages of a machine-readable text:
- The mutability of electronic texts will allow scholars to manipulate, revise, encode, and edit texts that will become instruments to advance and underpin their own textual analysis and interpretation; but others can also use these texts to verify research results, or to challenge and change interpretations by providing alternative tagging.
- The reproducibility of machine-readable texts will allow them to be transformed, preserved, and used in future media.
- The ease of transmission of e-texts across electronic networks will allow for alternatives to the current system of publication.
- Ultimately, the wide array of search possibilities will allow new questions to be asked, new ways to envision texts.

In other words, a tool is not just a tool; it has the potential to revolutionize our perspective. Electronic texts will do just that.

To fulfill this goal, we need a larger body of TEI-conformant SGML encoded e-texts,
Advanced Software and Powerful Workstations

New ACF Resources Planned for Arts and Media Support

by Philip Galanter
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The ACF will be offering broader and more powerful resources for those in the arts-and-media-related disciplines. As this newsletter is going to press, our plans are not final, and some of the details may change a bit in implementation. We plan to expand our support for animation applications using graphics workstations, in our resources for videographics, and in a facility for high-quality digital imaging.

Arts and Media Workstation Room

Resources for three-dimensional animation applications are being expanded this spring and summer in a workstation room in Warren Weaver Hall dedicated to arts-and-media applications. Two Silicon Graphics Iris Indigo 4000XZ systems will replace the current single system used to support animation classes from the TSOA Department of Film and the TSOA Interactive Telecommunications Program. A third such system will be added this fall. Each of the Indigo 4000XZ systems has two to three times the computational power of the present Indigo 3000XS, and twice the real-time graphics performance. Disk space is also being expanded, to allow about five gigabytes to be available for user files.

The Alias animation software will be upgraded to the latest release, which introduces new features such as inverse kinematics for modeling. Inverse kinematics adds intelligence to the models of objects the animator creates. This allows joint connections and constraints—for example in the wrist, elbow, and shoulder of a human-figure model—to interact and respond in a natural manner.

A full-featured system of animation software from Wavefront Technologies will also be added. This software includes user-friendly software for compositing multiple layers of digital animation, and for blending real-world video with rendered animations. It also includes software for particle animation, which can be used to simulate phenomena such as rain, snow, fire, and smoke.

Future areas of workstation-based application may include nonlinear video editing, video effects, and computer-assisted choreography using an interactive dance program called LifeForms. (See the January 1993

Faculty Artists and Staff to Meet for (Hi-Tech) Lunch Sessions

The ACF will soon be sponsoring two brown-bag lunch sessions each month.

One monthly session will be limited to NYU faculty artists interested in the use of computers and other technologies in their creative work, research, or teaching. At a typical session, one of the attendees will present an informal report on a work-in-progress or recent conference, or will demonstrate a new software tool or artistically useful technology. In addition, informal discussion will provide a way to exchange information, identify common interests and needs, and launch collaborations across schools and departments.

Another monthly session will be limited to NYU technical staff and graduate students charged with maintaining technical environments such as computer labs, video and film production facilities, and recording studios, in support of artistic programs. Here, too, there will usually be some kind of informal presentation, and time will also be set aside for free-form discussion of common problems, solutions, needs, and areas of interest.

Faculty and staff interested in attending should contact Philip Galanter via E-mail at galanter@nyu.edu or by phone at 998-3041.
issue for an overview of digital video applications such as nonlinear editing.)

**Arts and Media Videographics Studio**

The Arts and Media Videographics Studio is next door to the Workstation Room, and currently supports the frame-by-frame recording of animation sequences to 3/4-inch Umatic-SP tape, and the high-quality frame-by-frame digitization of video using a high-end Macintosh-based system and professional video equipment. This summer a new Silicon Graphics-based system for frame-by-frame recording will be added to the Videographics Studio. The Avanzar graphics board — installed in an older dedicated Silicon Graphics 4D/25 workstation, and used in conjunction with an upgraded Prime Image 810 full-frame digital interformat converter — can produce broadcast-quality animations in a number of formats, including D1 and Betacam. A Betacam recorder will be added to the Videographics Studio later next fall.

In addition, the Macintosh system will be upgraded to support nonlinear video editing, and SMPTE lock-up for digital audio dubbing.

**Arts and Media Digital Imaging System**

The Arts and Media Studio in the Education Building now supports medium-quality image scanning, along with draft-to-medium-quality color printing, and it offers a number of Macintosh systems with pressure-sensitive tablets and software tools for digital photography and painting.

Over the summer, two systems for high-quality film scanning and color printing will be added to the ACF facilities at Warren Weaver Hall, for use by faculty and advanced students. Initially we expect to support significant use in collaboration with the Tisch School Photography Department, but other uses will also be supported.

The image-scanning system will feature a Leafscan 45 film scanner. The Leafscan 45 uses a 6000-element CCD, allowing image resolution up to 5080 dpi and 48 bits of color resolution (16 bits per primary color). It supports most professional formats of color and black-and-white film, both negative and positive, including 35mm, 6x9cm, 2½" and 4"x5". By first scanning with 48 bits of color resolution, one can create 24-bit color images on the Mac that preserve both color fidelity and detail in highlights and shadows. Future color standards will support higher resolution, and take advantage of the Leafscan 45’s capabilities.

The printing system will feature a tabloid-format dye-sublimation printer; several brands are still under consideration. Such

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**Software at the ACF’s Arts and Media Studio**

The software listed below is installed in the ACF’s Arts and Media Studio in the Education Building at 35 West Fourth Street, which is equipped with powerful desktop computers, multimedia peripherals, and color printers. (For the latest information about equipment, hours, and access policies, please call the ACF HelpLine, 998-3333.) Similar hardware and software are available for use by faculty in the Faculty Microcomputer Lab; call 998-3044 for further information.

<table>
<thead>
<tr>
<th>Still Images</th>
<th>Moving Images</th>
<th>Ray Dream JAG 1.0.4</th>
<th>Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe Photosh 2.0.1</td>
<td>Adobe Premiere 1.0</td>
<td>Swivel 3D Pro 2.0</td>
<td>Aldus Persuasion 2.1</td>
</tr>
<tr>
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<td>Apple QuickTime 1.5</td>
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<td>HyperCard 2.1</td>
</tr>
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<td>MacroMedia MacroModel 1.0.0</td>
<td>Sound and Music</td>
<td>MacroMind Director 3.1</td>
</tr>
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<td>OpCode MID1play</td>
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<td>Voyager Videostack Toolkit 2.2</td>
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<td>MacroMind 3D 1.1</td>
<td>Digidesign Sound Designer II</td>
<td>Voyager CD-Audio Toolkit 1.2</td>
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<td>MacroMind Director 3.1</td>
<td>OpCode Cue 3.01</td>
<td>Interactive Tutorials</td>
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<td>OpCode Galaxy Plus 1.2.1m1</td>
<td>The Book of MIDI</td>
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<tr>
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<td>QuickPICS 1.0</td>
<td>OpCode Max 2.2</td>
<td>Macintosh Basics</td>
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<td></td>
<td>Raster Ops MediaGrabber</td>
<td>OpCode Studio Vision 1.4</td>
<td>Macintosh Electronic Reference</td>
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printers are capable of producing "match-print"-quality color and black-and-white prints up to 17" x 11", which appear similar to high-quality color photographic prints. Such a printer can be used to directly generate prints by photographers using digital tools, and to generate color proofs for publishers creating desktop color separations. In addition, we will be using color-management software such as the Apple Colorsync and Efi Eficolor systems. These provide a software architecture to produce consistent color from the scan to the screen, and out to the print. Software for importing, color-correcting, and printing images from non-Macintosh sources will also be provided. An article in the September issue of this newsletter will cover digital color management in depth.

Art, Science, and Robots: Symposium on Computer Animation Education
At a recent NYU symposium on Computer Animation and Multimedia Education, a panel of educators and professionals sought solutions to some of the issues facing them today. The symposium, hosted by the Tisch School of the Arts and the Courant Institute of Mathematics, and funded by an NYU Challenge Fund Grant, dealt with several central themes:

- How can science and art merge to achieve new standards in computer-graphics education? Will a new breed of students legitimately call themselves both scientists and artists? What curriculum is needed for them?
- How can universities lead the trends in development of multimedia and animation? Can they mold and create the future look and feel of computer graphics, rather than passively following the software and hardware companies?
- What are the ethical implications of the new techniques in computer graphics? How do they affect the way we understand media?
- Now that it is clear that computer graphics, animation, and multimedia are vital elements of a university curriculum, how do we provide the best possible education in these areas for our students?

The symposium was co-chaired by Lorie Loeb, Assistant Professor in the Department of Film and Television (TSOA) and Professor Kenneth Perlin, of the Department of Computer Science (CIMS). Professor Loeb teaches live-action and animation courses in Tisch and is active in her department's efforts to incorporate computer animation in its curriculum. Professor Perlin teaches computer graphics in the Robotics Lab and, together with his students, has developed an animation software program called Scratch, which is being used in many of the Computer Animation courses at Tisch.

The moderator was Peter Bardazzi, Adjunct Instructor of Computer Animation in the Department of Film and Television and the Photography Department (TSOA). The panel was made up of Joe Francis, a director at R/Greenberg Associates, whose work has appeared in such films as Predator and in countless commercials; Deanna Morse, an accomplished animator who teaches at Grand Valley State University in Michigan; Allison Druin, a visiting research scientist at the Robotics Lab of the Courant Institute; and Fred Ritchin, Assistant Professor in the Photography Department and Interactive Telecommunications Program at TSOA and author of In Our Own Image: The Coming Revolution in Photography.

The panelists spoke about their work and showed slides, videos, and demonstrations of interactive computer material. In a lively question-and-answer period after the presentations — and at a post-symposium reception — discussion centered on Professor Ritchin's provocative remarks on ethics. The broad audience interest has led the organizers to project more such sessions. For further information, please contact me at 998-1728 or at the E-mail address below.

-Lorie Loeb
loeb@acfluster.nyu.edu
Science and Visualization

New Software at the Visualization Center

Modeling Molecules with Spartan

by Robert Lancaster
lancaster@acfcluster.nyu.edu

Robert Lancaster is a Ph.D candidate in the Department of Chemistry (GSAS).

The ACP’s Visualization Center, in cooperation with the Departments of Chemistry and Biology, recently obtained Spartan, a molecular-orbital calculations program with a graphical user interface (GUI), from Wavefunction, Inc. Spartan is a package for studying the structure and properties of molecules, and displaying the molecules and some of their properties graphically.

Three Levels of Calculations

The Spartan package contains modules for calculations at various levels of theory — molecular mechanics, semi-empirical, and ab initio — which make different assumptions and sometimes give different results. Calculations involving these various levels can have vastly different computational requirements. Molecular mechanics are relatively simple calculations based on purely empirical data — the experimentally observed properties of molecules. These calculations are practically instantaneous on a modern workstation. Ab initio calculations, at the other extreme, start from the theoretical beginning and calculate the properties mathematically. Such calculations can take anywhere from half an hour to a few weeks for a medium-sized molecule, depending on the precision of the calculations and the computer system used. The semi-empirical calculations incorporate elements of both other types, using observed results from experiments to simplify the mathematical computations. These calculations take perhaps a few minutes for a medium-sized molecule.

Spartan can run its calculations on a number of different computer systems, including Cray supercomputers, but the graphics visualization part of the program can be used only on computers with graphics capabilities, such as the Silicon Graphics (SGI) and IBM RS/6000 workstations. The Visualization Center has several powerful SGI workstations available.

Abilities and Limitations

For the user, the most attractive features of Spartan are its ease of use and the wealth of its visualization routines. Beginners can easily perform even complicated molecular-orbital calculations that were previously difficult even for experts. Input files can be formed in a fraction of the time needed for the older programs. The visualization package allows chemists to see color presentations of important molecular properties, such as molecular geometry, molecular orbitals (which describe the shapes and energies of the orbits of the electrons), electrostatic-potential densities (which show the electronic properties of the molecules), and molecular vibrations. These properties are much more difficult to observe on older programs.

Spartan includes a set of molecular-mechanics force parameters from the program Tripos, and many of the most popular basis sets of mathematical functions from the widely used packages Gaussian and MOPAC. Spartan is capable of handling single-point calculations, geometry optimizations, and transition-state searches. Also, structures can be imported directly into Spartan from the Brookhaven Protein Data Bank. However, a number of commonly used basis sets are not included, and it must be said that Spartan is more limited and less flexible than the Gaussian and MOPAC packages. While some geometrical constraints are easier to implement using Spartan, others are more difficult. Structures (continued on page 26)
One of the more intriguing new molecules is the Buckyball — more formally, buckminsterfullerene, named after the inventor of the geodesic dome, which the structure resembles, although it looks even more like a soccer ball. The molecule consists of 60 carbon atoms arranged in a perfect hollow sphere. It was first produced at Rice University by Richard Smalley, Robert Curl, Harold Kroto, and coworkers in 1985 by heating a carbon disk to over 10,000°C with a pulsed laser beam.

Here the Buckyball demonstrates some of the visualization modes of Spartan: the tube model, at top, shows only the theoretical position of the bonds between the atoms, while the ball-and-stick model, next to it, shows the atoms as well. The irregular blobs that hover over the tubes of the HOMO (highest-occupied molecular orbital) model indicate the complex three-dimensional pathways of the two electrons in the molecule with the highest energy. The space-filling model, at the bottom, shows the space occupied by all of the electrons in the molecule.

The structure of the molecule illustrated here was imported from a MacroModel file constructed by Professor Steven Wilson of the Department of Chemistry (FAS), and the HOMO was calculated by the author.

— R.L.
Modeling Molecules (continued from page 24)
from those packages cannot be directly imported into Spartan for visualization purposes.

Spartan in Use at NYU
The program is already being used in the Chemistry Department, both in classes and for research. Spartan is being used to explain reactions — some of them unexpected — that were carried out at the department. In some cases, it is possible to use Spartan to predict the results of chemical reactions that have not yet been attempted.

In my own work, I use the program to calculate the structures and properties of molecules that have extremely short lifetimes — so short that they cannot be directly studied by standard analytical methods. Some of these molecules need to be calculated at very high levels of theory in order to obtain reliable results. The SGI workstations at NYU are capable of performing enormous calculations in a reasonable amount of time. I also use the program to suggest geometries to input into other programs.

Spartan was designed for use in the chemical industry, as well as in university research. An important industrial use of Spartan is to help determine which chemicals are more likely to be useful, and which reactions are worth attempting. While many chemical and pharmaceutical companies need to employ computational chemists to assist their experimental chemists, Spartan is easy enough for the latter to use with minimal specialized training.

Crimson and Indigo: New High-End Silicon Graphics Machines
The ACF has acquired several state-of-the-art Silicon Graphics IRIS workstations to enhance the resources of its Visualization Center. These include a large Crimson Elan server and several Indigo XZ desktop systems to replace and supplement the existing high-performance graphics workstations. Both the Crimson Elan and the Indigos come equipped with the SGI R4000 processor, which has an internal clock rated at 100 MHz (megahertz). The Crimson will soon be upgraded with an R4000A cpu rated at 150 MHz, making it one of the fastest computers on campus.

All the machines have 19-inch high-resolution monitors, at least 32 megabytes of memory, and one gigabyte of disk storage. Each of the Indigo machines has two powerful graphics subsystems independent of the central processing unit, while the Crimson employs four graphics subsystems. These new systems have been deployed, and they have already facilitated and enhanced both research and instruction in biology, chemistry, math, applied science, robotics, and the medical sciences.

Coupled with some of the most advanced molecular-modeling and computationally intense software packages available — Spartan, from Wavefunction, and Insight and Discover from Biosym Technologies — as well as other scientific visualization software such as Explorer, SciChn, Khoros, and GRASS, these resources should enhance the quality and increase the productivity of scientists and students at the University. The systems have an impressive array of other software installed, from commercial sources and from many government-funded supercomputing centers and research establishments. The Visualization Center also offers the latest technologies to record images from these systems on printers, both color and black-and-white, and on videodisk and videotape.

For details on the hardware architecture and the IRIX operating system, please contact the ACF’s Silicon Graphics systems manager, Hua Deng (huad@acfcluster.nyu.edu or 998-3053). To apply for an account on these machines, see the Accounts Office (Room 305, Warren Weaver Hall, 998-3035).

— Ed Friedman
friedman@acfcluster.nyu.edu
New DECsystem 5900s Installed

The ACF Upgrades Its Shared UNIX Computing Facilities

by Chetan Dube
dube@nyu.edu

This spring, the ACF upgraded its UNIX minicomputers to a new generation of systems. From the older DEC and Sun systems (called ACF3, 5, 9, 14, and 15), UNIX computing has moved to the more advanced DECsystem 5900 machines now addressed as ACF2 and ACF4.

The transition went smoothly, without having to take any of the systems out of service. All systems continued to function normally the entire time, and every effort was made to minimize the impact on users. For the most part, a user did not notice anything other than a momentary interruption when his or her account was unlinked from the old system and linked to the new system disks.

The transition involved many thousands of user accounts and several gigabytes of data. Forty-three programs on seven different hosts (five systems acting as senders and two as receivers) worked round the clock for over four days to implement the transition. The programs operated concurrently, and frequently communicated with each other.

The New Machines

The DEC 5900s are based on the R3000 RISC (reduced-instruction-set computer) chips, which tend to run faster than the previous generation of chips. These systems (running Ultrix 4.3) are rated at 42.9 MIPS (million instructions per second), which makes them versatile and powerful dataservers, with a large capacity for high-performance software. These top-of-the-line systems from DEC clearly outperform the earlier generation machines in almost every respect. Sometime this summer, we will receive a CPU upgrade that will increase the systems' performance perhaps another 25 percent.

Besides local disks, the systems have access to a shared disk pool via a turbo-channel CI (computer interconnect) bus. The total storage for user files is over 10 gigabytes (much more that the 1 to 2 gigabytes available on each of the earlier systems). Each new system has 128 megabytes of random-access memory.

The systems can do everything their predecessors could, and more. All the software available on the previous platforms is supported on the new systems as well. Some of the popular software products on the new systems are listed in the accompanying box. For further information, please contact me at dube@nyu.edu or 998-3055.

A Selection of the Software on the New UNIX Machines


* Editors: Ed, Edit, Vi, EMACS.

* Applications: Macsyma, Matlab, Mathematica, NAG, NCAR, Maple, Mongo.

* Text Formatters: Documenter's Workbench (troff, nroff), LaTeX, TeX.

* Communications: C-Kermit.
Joint IBM-ACF Project

Update on the Center for Applied Parallel Computing

by Ed Friedman
friedman@acfcluster.nyu.edu

In the January issue, we announced the new Center for Applied Parallel Computing (CAPC) at the ACF. This facility, set up in collaboration with the IBM Corporation, will permit NYU students and faculty to explore the development and adaptation of computer applications in a parallel-computing environment. The system is now up and running. Potential users in the NYU community will be interested to know details of the hardware and software available.

Hardware Configuration and Nominal Ratings

The hardware consists of a cluster of IBM RS/6000 workstations, switches, and storage. There are eight Model 340 systems, each with 32 megabytes of physical memory and one gigabyte of disk storage, and a single IBM 580 system with one megabyte of memory and over 10 gigabytes of disk storage. The machines are interconnected by an IBM V-7 high-speed sixteen-node switch. The eight Model 340 systems are collectively rated at a peak of almost 120 megaflops as measured by the Linpack 100 benchmark, while the Model 580 is measured at nearly 40 megaflops.

Software Offerings

The machines are all running the IBM's AIX variant of the UNIX operating system, and support applications based on the programming languages Fortran 77 and C. Third party applications now available are:

• PVM — a public-domain programming environment for parallel computing.
• PVMe — an IBM variant of PVM that exploits the V-7 cross-bar switch.
• FORGE 90 — a performance analysis and measuring tool (see description in the March 1993 issue).
• Network Linda Fortran and C — parallel versions of these popular programming languages.
• Parasoft Express — a parallel-programming environment with extensions to operate in the hardware configuration described above.
• Fortran 90 — a full implementation of the latest standard that includes constructs such as vectors and matrices as variables (also discussed in the March 1993 issue).
• Gaussian 92 — a large suite of computational-chemistry programs.
• Spartan — a molecular-modeling and computationally intense collection of programs of interest to students and researcher in biology and chemistry (see article on page 24).
• MATLAB — an interactive set of programs and tools to facilitate the use of the underlying linear-algebra-based software to solve small and large scale in matrix and eigenvalue problems. The latest version has embedded within it a well-engineered set of scientific-visualization tools using the X11 windowing system (see article in the January issue).

If you are interested in using these machines, or want further information, please contact me by E-mail at the address above or by phone at 998-3051.
Rhonda Zangwill is the public affairs manager for Bobst Library.

W
ho said good things come to those who wait? At Bobst Library, a new CD-ROM network has largely eliminated "waiting time" for using its most popular CD-ROMs, including New York Times Full Text, and PA Research II.

The CD-ROM network, designed by technical support coordinator Tim O'Connor, runs on a Novell Network outfitted with SCSI Express, a software product that makes the Novell server treat CD-ROM drives as if they were hard disks. "This is a perfect, cost-effective method of meeting the increasing demand for CD-ROMs," said O'Connor. "Rather than purchasing and maintaining lots of drives for use throughout the library, all of the equipment, and the CDs, are centrally housed. For access, users need only select a particular resource from a menu on any one of more than a dozen workstations located in the three reference centers."

The network is easy to use. Thanks to the "menu-scripts" O'Connor developed, the technology involved in the network is completely transparent to users. Once a specific resource is chosen from the menu — Newspaper Abstracts for example — no new commands are involved because the search strategy is identical to what it was before the resource was networked.

The CD-ROMs available in each reference center generally reflect the appropriate subject areas in that center, although there will be some overlap and some CD-ROMs will continue to be accessible solely through stand-alone workstations. The CD-ROM network is available only on-site at Bobst (no dial-in access).

For more information about Bobst's CD-ROM network, please contact Lucinda Covert-Vail at 998-2497.

CD-ROM Resources at Bobst

<table>
<thead>
<tr>
<th>General and Humanities Reference (1st floor)</th>
<th>Business and Social Science Reference (6th floor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>networked</td>
<td>networked</td>
</tr>
<tr>
<td>•Dissertation Abstracts</td>
<td>•ABI/Inform</td>
</tr>
<tr>
<td>•MLA</td>
<td>•ERIC</td>
</tr>
<tr>
<td>•New York Times Full Text</td>
<td>•InfoTrac — General Business File</td>
</tr>
<tr>
<td>•Newspaper Abstracts</td>
<td>•New York Times Full Text</td>
</tr>
<tr>
<td>•PA Research II</td>
<td>•Newspaper Abstracts</td>
</tr>
<tr>
<td>•PAIS</td>
<td>•PA Research II</td>
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<tr>
<td></td>
<td>•PAIS</td>
</tr>
<tr>
<td>Science Reference (9th floor)</td>
<td>•Predicasts F&amp;S Plus - US</td>
</tr>
<tr>
<td>networked</td>
<td>•PsycLit</td>
</tr>
<tr>
<td>•ABI/Inform</td>
<td>also available</td>
</tr>
<tr>
<td>•ERIC</td>
<td>•Compact Disclosure</td>
</tr>
<tr>
<td>•PA Research II</td>
<td>•Census Data</td>
</tr>
<tr>
<td>•PAIS</td>
<td>•National Trade Data Bank</td>
</tr>
<tr>
<td>•PsycLit</td>
<td>•Worldscope</td>
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<tr>
<td>also available</td>
<td></td>
</tr>
<tr>
<td>•Medline</td>
<td></td>
</tr>
<tr>
<td>•Nursing Databases</td>
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</tbody>
</table>

Booking Media by Computer

With a VAX computer and Medianet software in the Library, Campus Media Support Services (CMSS) is now automated. CMSS, which brings you everything from portable PA systems to VCRs, happily abandoned manual record-keeping and embraced online scheduling and tracking. Medianet's three related databases — clients, equipment, and rooms — allow CMSS to deliver media services around campus more efficiently.

Medianet reserves the equipment for the required time period (allowing for travel time), thereby preventing double-bookings. In addition to its day-to-day operational benefits, this system will enable the Library staff to determine future equipment needs based on usage patterns.
**INET ’93: International Networking**

INET ’93, to be held in San Francisco on August 17–20, 1993, will focus on worldwide issues of research and academic networking. The agenda will include reports on research and academic networks throughout the world, along with sessions on a broad range of topics:

- Advances in network technology, protocols, and security.
- Engineering the global infrastructure, and assuring interoperability.
- Support of international communities of interest, including international collaboration and access to scientific data.
- Work and play in Cyberspace.
- Multilingual networking and multiple national character sets.

For further information, send an E-mail request via the Internet: request@inet93.stanford.edu.

The Internet Society, which sponsors INET, is a professional society whose goal is to support and promote the evolution and growth of the Internet as a global research communications infrastructure. INET ’93 will be held immediately before INTEROP ’93, the leading trade show for Internet technologies.

**Distance Education Conference**

The EDUCOM conference Distance Education: Sharing the Experience is scheduled for October 27–30 in Portland, Oregon. The conference will provide a professional forum for practitioners of distance education to exchange practical strategies and applications. Conference sessions will examine issues such as how to promote and model inter-institutional partnerships, incentives to move faculty toward adoption and advocacy of technology-based instruction, critical administrative and instructional-support services, regulatory policies and legislation that affect distance education, and evaluation of administrative, fiscal, and instructional efficiency of distance education programs.

For more information, contact Don Olcott by E-mail at olcottd@ccmail.orst.edu or by fax at (503) 737-2734.

**Other Upcoming Events of Interest**

**June 17–18:** Virtual Reality and Disability.
San Francisco. Contact: vr@vax.csun.edu or (818) 885-2578.

**September 30–October 1:** NYSERNNet Conference ’93. Rochester, New York. Contact: conference@nysernet.org or (315) 443-4120.

**October 1–2:** International Conference on Refereed Electronic Journals: Towards a Consortium for Networked Publications.
Winnipeg. Contact: umih@ccu.umanitoba.ca or (204) 474-9599.

**October 7, 1992:** Hypermedia ’93 — Extending the Reach of Educators, Indianapolis, Indiana.
Contact: hyper93@indycms.iupui.edu or (317) 274-4505.

**October 17–20:** EDUCOM ’93 — Crafting New Communities. Cincinnati, Ohio.
Contact: conf@educom.edu

**Electronic Texts (continued from page 20)**

...both new texts, edited by scholars and published by individuals, scholarly societies and commercial publishers, and older texts scanned with improved OCR (optical character recognition) equipment and encoded according to the TEI Guidelines. Libraries will have to collect and archive electronic texts and provide local and remote access to them. Technologically and philosophically, research libraries are in a good position to cope with e-texts and support the scholar’s future research requirements; but they will need to address certain budget issues if they are to meet these challenges effectively. The development of software for text analysis has to be encouraged, but it must be both easier to use and independent of specific programming language. Specialists in humanities computing need to emphasize the intellectual nature of their work; we can then look forward to more exciting and meaningful research that incorporates text-directed computing as one of its tools.
# Summer '93 at the ACF

## Important Dates for ACF Users

Users of ACF facilities should be aware of the following dates and deadlines, when schedules change, accounts expire, and files must be archived. For schedules and dates of operation of the ACF facilities, see the inside back cover; for details on registering for computer accounts, see the box on the Workshops page.

### May

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>May 1, onward</td>
<td>Instructors apply for Summer Session I and II Computer Class Accounts as early as possible.</td>
</tr>
<tr>
<td>May 1, onward</td>
<td>Instructors may begin to apply for Fall Semester computer Class Accounts.</td>
</tr>
<tr>
<td>May 1–Aug. 31</td>
<td>Individual Account holders who will not be returning for 1993/94 should archive their files.</td>
</tr>
<tr>
<td>May 1–Aug. 31</td>
<td>Individual Account holders should apply for renewal of their accounts before leaving for the summer. (Individual Accounts expire on Aug. 31.)</td>
</tr>
<tr>
<td>May 5–12</td>
<td>Spring Semester final examinations .................................................. regular hours, plus Sundays</td>
</tr>
<tr>
<td>May 12 Wed.</td>
<td>Spring Semester ends.</td>
</tr>
<tr>
<td>May 13 Thurs.</td>
<td>Commencement ................................................................................ regular hours</td>
</tr>
<tr>
<td>May 19 Wed.</td>
<td>Student Class Accounts issued for the Spring Semester expire.</td>
</tr>
<tr>
<td>May 24 Mon.</td>
<td>ACF's summer hours begin ................................................................ hours to be announced</td>
</tr>
<tr>
<td>May 24 Mon.</td>
<td>Summer Session I begins.</td>
</tr>
<tr>
<td>May 24–June 7</td>
<td>Students with Summer Session I Class Accounts register for computer use.</td>
</tr>
<tr>
<td>May 29–31</td>
<td>Memorial Day* Weekend ...................................................................... all sites closed</td>
</tr>
</tbody>
</table>

### June

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>June 21–July 2</td>
<td>Students who expect Incompletes in Summer Session I courses should apply for computer account extensions. (Instructor's signature required.)</td>
</tr>
<tr>
<td>June 21–July 2</td>
<td>Students with Summer Session I Class Accounts should archive all files they wish to keep.</td>
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</table>

### July

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>July 2 Fri.</td>
<td>Summer Session I ends.</td>
</tr>
<tr>
<td>July 3–5</td>
<td>Independence Day* Weekend ................................................................ all sites closed</td>
</tr>
<tr>
<td>July 6 Tues.</td>
<td>Summer Session II begins.</td>
</tr>
<tr>
<td>July 6–19</td>
<td>Students with Summer Session II Class Accounts register for computer use.</td>
</tr>
<tr>
<td>July 26–Aug. 13</td>
<td>Students with Summer Session II Class Accounts should archive all files they wish to keep after Aug. 13.</td>
</tr>
<tr>
<td>July 26–Aug. 13</td>
<td>Students who expect Incompletes in Summer Session II courses should apply for computer account extensions. (Instructor's signature required.)</td>
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</table>

### August

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Aug. 13 Fri.</td>
<td>Summer Session II ends.</td>
</tr>
<tr>
<td>Aug. 13 Fri.</td>
<td>Student Class Accounts issued for the Summer Sessions expire.</td>
</tr>
<tr>
<td>Aug. 31 Tues.</td>
<td>Date by which Individual Account holders who will not be using their computer accounts in 1993/94 must store their files off-line on tape or floppy disk.</td>
</tr>
</tbody>
</table>

### September

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>Sept. 4–6</td>
<td>Labor Day* Weekend ........................................................................ all sites closed</td>
</tr>
<tr>
<td>Sept. 9 Thurs.</td>
<td>Fall Semester begins ................................................................ regular fall hours</td>
</tr>
</tbody>
</table>

* University holiday
New computer users at NYU are welcome to take part in the ACF’s introductory-level “walk-in” tutorials. Reservations are not required. Simply arrive a few minutes early at the site where the tutorial is being given. There is no charge, but participants should have a current, valid NYU ID. In addition, some tutorials require a computer account (see below). All tutorials are about one hour long.

Faculty may arrange tutorials specially for their classes or research groups. In some instances, it may be possible to arrange for training to take place at a location selected by the requesting instructor or department. For IBM WYLBUR or VM/CMS, call John Lee (998-3406); for Statistics, call Frank LoPresti (998-3398); for all other applications, contact the ACF HelpLine (998-3333).

### Computers and Operating Systems

<table>
<thead>
<tr>
<th>MS-DOS (IBM PC)</th>
<th>VMS (DEC minicomputers; requires account)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introductory</strong></td>
<td>Third Ave. No. Res. Hall, basement</td>
</tr>
<tr>
<td>Education Building, second floor</td>
<td>Third Ave. No. Res. Hall, basement</td>
</tr>
<tr>
<td>Thursdays</td>
<td>Third Ave. No. Res. Hall, basement</td>
</tr>
<tr>
<td>June 3</td>
<td>July 8</td>
</tr>
<tr>
<td><strong>Intermediate</strong></td>
<td>Upon request, by appointment; call John Lee at 998-3406.</td>
</tr>
<tr>
<td>Education Building, second floor</td>
<td>Upon request, by appointment; call John Lee at 998-3406.</td>
</tr>
<tr>
<td>Thursdays</td>
<td>Upon request, by appointment; call John Lee at 998-3406.</td>
</tr>
<tr>
<td>June 10</td>
<td>July 15</td>
</tr>
<tr>
<td><strong>Advanced:</strong></td>
<td>Windows 3.1 and MS-DOS 5</td>
</tr>
<tr>
<td>Norton Utilities and MS-DOS 5</td>
<td>Windows 3.1 and MS-DOS 5</td>
</tr>
<tr>
<td>Warren Weaver Hall, Room 313</td>
<td>Warren Weaver Hall, Room 313</td>
</tr>
<tr>
<td>Wednesdays</td>
<td>Warren Weaver Hall, Room 313</td>
</tr>
<tr>
<td>12:00 noon</td>
<td>Warren Weaver Hall, Room 313</td>
</tr>
<tr>
<td>June 16</td>
<td>June 24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNIX (Ulrix 4.3) (DEC minicomputers; requires account)</th>
<th>WYLBUR (IBM mainframe; requires account)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third Ave. No. Res. Hall, basement</td>
<td>Tisch Hall, Room LC-8</td>
</tr>
<tr>
<td>Mondays</td>
<td>Tisch Hall, Room LC-8</td>
</tr>
<tr>
<td>5:30 pm</td>
<td>Tisch Hall, Room LC-8</td>
</tr>
<tr>
<td>June 7 through July 26 (except July 5)</td>
<td>Tisch Hall, Room LC-8</td>
</tr>
<tr>
<td>Wednesdays</td>
<td>Tisch Hall, Room LC-8</td>
</tr>
<tr>
<td>2:00 pm</td>
<td>Tisch Hall, Room LC-8</td>
</tr>
<tr>
<td>June 2 through July 28</td>
<td>Tisch Hall, Room LC-8</td>
</tr>
</tbody>
</table>

### Communications

<table>
<thead>
<tr>
<th>Electronic Mail (requires account)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using DEC/VMS Mail at NYU. For holders of ACF E-mail Accounts (see box on next page) and holders of regular ACFcluster (ACF*) Accounts. User will work from IBM PCs.</td>
</tr>
<tr>
<td>Education Building, second floor</td>
</tr>
<tr>
<td>Wednesdays</td>
</tr>
<tr>
<td>12:00 noon</td>
</tr>
<tr>
<td>June 16 through July 14</td>
</tr>
</tbody>
</table>

Please note: the E-mail tutorials previously scheduled to take place on Mondays and Tuesdays between May 17 and June 29 have been cancelled.

<table>
<thead>
<tr>
<th>Uploading and Downloading (requires appropriate account)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A useful tutorial for electronic mail users who want to combine E-mail with wordprocessing on micros and for VMS and UNIX users who want to work on the micro and then upload. Telnet, FTP, and LISTSERV access will be discussed.</td>
</tr>
<tr>
<td>For Macintosh users</td>
</tr>
<tr>
<td>Education Building, second floor</td>
</tr>
<tr>
<td>Wednesdays</td>
</tr>
<tr>
<td>12:00 noon</td>
</tr>
<tr>
<td>June 16</td>
</tr>
<tr>
<td>July 21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>For IBM PC users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education Building, second floor</td>
</tr>
<tr>
<td>Thursdays</td>
</tr>
<tr>
<td>12:00 noon</td>
</tr>
<tr>
<td>June 17</td>
</tr>
<tr>
<td>July 22</td>
</tr>
</tbody>
</table>
Statistics

SPSS/PC+
(IBM PC, WYLBUR, VMS)
Education Building, second floor
A widely used package of programs with excellent documentation.

- Wednesdays 5:00 pm
  June 9    July 21

Karel
(Mac)
Offered at the request of the Computer Science Department (FAS) for students in A22.002. Each Karel tutorial is limited to ten students. (Students must bring a double-sided, double-density 3.5-inch diskette.)

- Education Building, second floor
  10:00 am
  Tuesday, July 6
  Thursday, July 8
  Monday, July 12
  Wednesday, July 14
  Friday, July 16

- 2:00 pm
  Wednesday, July 7
  Friday, July 9
  Tuesday, July 13
  Thursday, July 15

Wordprocessing and Typesetting

WordPerfect
(IBM PC)
Third Ave. No. Res. Hall, basement
A popular multi-purpose word processing program.

- Tuesdays 2:00 pm
  June 8 through July 27
- Wednesdays 5:30 pm
  June 9 through July 28

On Request...
The following tutorials are given upon request, by appointment. Please call Frank LoPresti at 998-3398 for further information.

- Analyzer
  (Mac)
  Part of MacMath. Analyzes x-y functions with interactive graphic display. Draws derivatives, integrates controlling number of partitions, etc.

- Minitab
  (VAX)
  An interactive, exploratory statistical package on VMS.

- StatView
  (Mac)
  Easiest Mac-based spreadsheet-like statistical package.

- Systat
  (Mac, IBM PC)
  Interactive statistical package available on both Mac and PC. Interesting graphics display of data relationships.

- LaTeX
  Computer typesetting for scientific applications. Given upon request, by appointment. Please call Jae Fried at 998-3436 for further information.

Academic Computing and Networking at NYU — May 1993 — 33
ACF Microcomputer Workshops

The ACF’s non-credit, hands-on workshops in personal computing are open to NYU faculty, staff, and students. Registration is required, but there is no fee for the workshops. To register, during the week of the workshop, please call the ACF HelpLine at 998-3333. So that as many registrants as possible may be accommodated, some may be asked to share computers.

For IBM PC Users

At the ACF’s Education Building lab, 35 West Fourth Street, second floor. Morning workshops run from 9:00 am to 12:00 noon, afternoon workshops, from 1:00 pm to 4:00 pm.

<table>
<thead>
<tr>
<th>WordPerfect 5.1</th>
<th>WordPerfect Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductory</td>
<td>Introductory</td>
</tr>
<tr>
<td>Fridays</td>
<td>Fridays</td>
</tr>
<tr>
<td>May 14, 28</td>
<td>May 21</td>
</tr>
<tr>
<td>June 11, 25</td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td>1:00 pm</td>
</tr>
<tr>
<td>May 21</td>
<td></td>
</tr>
<tr>
<td>Intermediate</td>
<td></td>
</tr>
<tr>
<td>Fridays</td>
<td>1:00 pm</td>
</tr>
<tr>
<td>May 14, 28</td>
<td></td>
</tr>
<tr>
<td>June 11, 25</td>
<td></td>
</tr>
</tbody>
</table>

Index of ACF Tutorials and Workshops, Summer '93

- Analyzer p. 33
- dBASE IV p. 34
- E-Mail p. 32
- HyperCard p. 34
- Karel p. 33
- LaTeX p. 33
- Lotus 1-2-3 p. 34
- MacDraw p. 34
- Minitab p. 33
- MS-DOS p. 32
- MS Excel p. 34
- MS Windows p. 32
- MS Word p. 34
- SPSS/PC+ p. 33
- Statview p. 33
- Superpaint p. 34
- Systat p. 33
- UNIX p. 32
- VM/CMS p. 32
- VMS p. 32
- Up/Downloading p. 32
- WordPerfect (PC) p. 33
- pp. 33, 34
- WordPerfect Graphics p. 34
- WYLBUR p. 32

For Macintosh Users

At the ACF’s Education Building lab, 35 West Fourth Street, second floor. Morning workshops run from 10:00 am to 11:30 am, afternoon workshops from 1:00 pm to 3:30 pm.

<table>
<thead>
<tr>
<th>Microsoft Word</th>
<th>SuperPaint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductory</td>
<td>Wednesday</td>
</tr>
<tr>
<td>Fridays</td>
<td>June 9</td>
</tr>
<tr>
<td>May 21</td>
<td></td>
</tr>
<tr>
<td>Thursday</td>
<td>10:00 am</td>
</tr>
<tr>
<td>June 3, 24</td>
<td></td>
</tr>
<tr>
<td>Intermediate</td>
<td></td>
</tr>
<tr>
<td>Thursdays</td>
<td>Wednesday</td>
</tr>
<tr>
<td>June 3, 24</td>
<td>June 16</td>
</tr>
<tr>
<td>Part I</td>
<td>Thursday</td>
</tr>
<tr>
<td>June 23</td>
<td>1:00 pm</td>
</tr>
<tr>
<td>Part II</td>
<td></td>
</tr>
<tr>
<td>Thursday</td>
<td></td>
</tr>
<tr>
<td>June 17</td>
<td>1:00 pm</td>
</tr>
</tbody>
</table>

Excel 4.0

- Wednesday 1:00 pm
- June 23

HyperCard

- Part I
- Thursday 1:00 pm
- June 10
- Part II
- Thursday 1:00 pm
- June 17

Student Registration for ACF “Class Accounts”

Students whose instructors have requested course-related “Class Accounts” on ACF computers (whether PC, Macintosh, VAX/VMS, or UNIX) must register for computer use. You may register, beginning May 24, at any of the following ACF computer labs during their hours of operation (see schedules on the inside the back cover). Please remember to bring your printed SIS-generated list of confirmed scheduled classes and a valid NYU ID.

- Education Building (35 West Fourth St., 2nd floor)
- Tisch Hall (40 West Fourth St., room LC-8)
- Third Ave. North Res. Hall (at 11th St., basement)

(Note: Students with Class Accounts on the IBM mainframe’s WYLBUR system do not register in this fashion; they obtain their accounts from their instructors.)
<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Sat/Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Instructors apply for Summer Session I and II Class Accounts as early as possible. • Individual Account holders not renewing for 1993/94 should archive files (through Aug. 31).</td>
<td>• Individual account holders should apply for renewal of their accounts before leaving for the summer (Ind. Accounts expire on Aug. 31)</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15/16</td>
</tr>
<tr>
<td>17</td>
<td>18</td>
<td>19</td>
<td>20</td>
<td>21</td>
<td>22/23</td>
</tr>
<tr>
<td>• ACF's summer hours begin. • Summer Session I begins. • Students with Summer Session I Class Accounts register for computer use (through June 7).</td>
<td>• Spring semester ends. • Instructors may begin to apply for Fall Semester computer Class Accounts.</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15/16</td>
</tr>
<tr>
<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29/30</td>
</tr>
<tr>
<td>• Students who expect incompletes should apply for account extensions (through July 2)</td>
<td>• Student accounts issued for the Spring Semester expire.</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15/16</td>
</tr>
<tr>
<td>31</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5/6</td>
</tr>
<tr>
<td>• Memorial Day</td>
<td>Tutorials: VMS</td>
<td>Tutorials: UNIX</td>
<td>Tutorials: MS DOS Intro; WYLBUR Workshops: MS Word Intro; MS Word Intermed</td>
<td>Tutorials: WYLBUR Intro Workshops: Intro to Lotus; Intro to dBASE IV</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12/13</td>
</tr>
<tr>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19/20</td>
</tr>
<tr>
<td>Tutorials: WYLBUR; UNIX</td>
<td>Tutorials: VMS; WordPerfect</td>
<td>Tutorials: MS DOS Advanced Norton; Uploading and Downloading (Mac); UNIX; E-mail; WordPerfect Workshops: MacDraw</td>
<td>Tutorials: WYLBUR; Uploading and Downloading (PC) Workshops: HyperCard Part II</td>
<td>Tutorials: WYLBUR Intro</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>26/27</td>
</tr>
<tr>
<td>Tutorials: WYLBUR; UNIX • Students who expect incompletes should apply for account extensions (through July 2)</td>
<td>Tutorials: VMS; WordPerfect • (Through July 2) Students with Summer Session I Class Accounts should archive all files they wish to keep.</td>
<td>Tutorials: UNIX; E-mail; WordPerfect Workshops: Excel</td>
<td>Tutorials: MS DOS Advanced MS Windows; WYLBUR Workshops: MS Word Intro; MS Word Intermed</td>
<td>Tutorials: WYLBUR Intro Workshops: WordPerfect Intro; WordPerfect Intermed</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>29</td>
<td>30</td>
<td>31</td>
<td>2</td>
<td>3/4</td>
</tr>
<tr>
<td>Tutorials: WYLBUR; UNIX</td>
<td>Tutorials: VMS; WordPerfect</td>
<td>Tutorials: UNIX; E-mail; WordPerfect</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MAY**

**JUNE**

**JULY**

Academic Computing and Networking at NYU — May 1993 — 35
### JULY

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Sat/Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10/11</td>
</tr>
<tr>
<td></td>
<td>Tutorials: Karel (Mac); VMS; WordPerfect</td>
<td>Tutorials: Karel (Mac); UNIX; E-mail; WordPerfect</td>
<td>Tutorials: MS DOS Intro; Karel (Mac)</td>
<td>Tutorials: Karel (Mac)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Independence Day University holiday.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17/18</td>
</tr>
<tr>
<td>Tutorials: Karel (Mac); UNIX</td>
<td>Tutorials: Karel (Mac); UNIX; E-mail; WordPerfect</td>
<td>Tutorials: MS DOS Intro; Karel (Mac)</td>
<td>Tutorials: Karel (Mac)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>20</td>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24/25</td>
</tr>
<tr>
<td>Tutorials: UNIX</td>
<td>Tutorials: VMS; WordPerfect</td>
<td>Tutorials: MS DOS Advanced Norton; Uploading and Downloading (Mac); SPSS/PC+; UNIX; WordPerfect</td>
<td>Tutorials: Uploading and Downloading (PC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>30</td>
<td>31/1</td>
</tr>
<tr>
<td>Tutorials: UNIX</td>
<td>Tutorials: MS DOS</td>
<td>Tutorials: UNIX; WordPerfect</td>
<td>Tutorials: MS DOS Advanced MS Windows</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Students with Summer Session II Class Accounts should archive all files they wish to keep after Aug. 13.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### AUG

| 2      | 3       | 4       | 5       | 6       | 7/8     |
| 9      | 10      | 11      | 12      | 13      | 14/15   |
|        |         |         |         |         |         |
| 16     | 17      | 18      | 19      | 20      | 21/22   |
| 23     | 24      | 25      | 26      | 27      | 28/29   |
| 30     | 31      | 1       | 2       | 3       | 4/5     |

### SEPT

| 6      | 7       | 8       | 9       | 10      | 11/12   |
|        |         |         |         |         |         |
Important ACF Telephone Numbers
ACF HelpLine 998-3333
Account Information 998-3035
Computer Documentation 998-3036
Faculty Microcomputer Lab 998-3044
Applications Consultants:
14 Washington Place 998-3396
Tisch Hall 998-3434
Education Building 998-3423
Warren Weaver Hall 998-3037
Third Ave. North Res. Hall 998-3500

Computer Labs:
14 Washington Place 998-3457
Tisch Hall 998-3409
Education Building 998-3421
Warren Weaver Hall 998-3456
Third Ave. North Res. Hall 998-3504

Dial-in Access to ACF Computers
(Via NYU-NET, NYU's campus-wide network.)

If calling from Dial For (bps)
Off Campus 995-3600 300 - 2400
995-435* 300 - 1200
995-434 4800, 9600,
12000 or
14400
*This number is recommended if you are using an old-style modem that has no error-correcting.

Summer Hours at ACF Sites

User Work Areas:

<table>
<thead>
<tr>
<th>Site</th>
<th>Mon. - Fri.</th>
<th>Sat.</th>
<th>Sun.</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 Washington Place</td>
<td>closed</td>
<td>closed</td>
<td>closed</td>
</tr>
<tr>
<td>Tisch Hall*</td>
<td>8:30 am - 11:30 pm</td>
<td>8:30 am - 5:30 pm</td>
<td>10:30 am - 5:30 pm</td>
</tr>
<tr>
<td>Education Building*</td>
<td>8:30 am - 11:30 pm</td>
<td>8:30 am - 5:30 pm</td>
<td>10:30 am - 5:30 pm</td>
</tr>
<tr>
<td>Third Ave. North**</td>
<td>10:30 am - 1:30 am</td>
<td>10:30 am - 5:30 pm</td>
<td>10:30 am - 5:30 pm</td>
</tr>
</tbody>
</table>

Consultants:

<table>
<thead>
<tr>
<th>Site</th>
<th>Mon. - Fri.</th>
<th>Sat.</th>
<th>Sun.</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 Washington Place</td>
<td>closed</td>
<td>closed</td>
<td>closed</td>
</tr>
<tr>
<td>Tisch Hall</td>
<td>9:00 am - 9:00 pm</td>
<td>9:00 am - 5:00 pm</td>
<td>closed</td>
</tr>
<tr>
<td>Education Building</td>
<td>8:30 am - 9:00 pm</td>
<td>9:00 am - 5:00 pm</td>
<td>closed</td>
</tr>
<tr>
<td>Third Ave. North</td>
<td>10:30 am - 10:00 pm</td>
<td>10:30 am - 5:30 pm</td>
<td>10:30 am - 5:30 pm</td>
</tr>
</tbody>
</table>

*Available to general users from 8:30 am to 1:00 pm, Monday - Friday, and to priority-access account holders during all hours of operation.

**Currently available to general users and to priority access account holders during all hours of operation.

Please note: confirmed holiday schedules will be posted via our online news and bulletin board facilities, and ACF offices in Warren Weaver Hall are closed on University holidays.
From the Director
The Global Network 1

Instructional Computing
Living Case: Making Business Problems Fun 5
Spring '93 Colloquium: Computer-Aided Language Instruction 7
Computer Access for People with Disabilities 8

Networks and Network Services
Extending the Network to NYC Schools 9
New Local Dialup Access to NYU-NET for Users in Nassau County 11
The Federal Register via the Internet 12
NYSERNet Wins Prestigious ALOT Grant 12

Social Science Computing
Interest in Spatial Analysis and Geographic Information Systems Continues to Grow 13

Microcomputers
Disinfect Your Hard Drive for Trouble-Free Computing This Summer 15
At the ACF's Micro Labs 15
SPSS for Windows Now Available at ACF 16

Computing in the Humanities
Text Encoding Initiative and Electronic Texts: A Promise for Humanities Research 17
Humanist and ARTFL: Discussion List and Database 18

Arts and Media
New ACF Resources Planned for Arts and Media Support 21
Faculty Artists and Staff to Meet for Lunch Sessions 21
Symposium on Computer Animation Education 23

Science and Visualization
Modeling Molecules with Spartan 24
Spartan Meets the Buckyball 25
Crimson and Indigo: New High-End Silicon Graphics Machines 26

Supers, Mainframes, and Minis
ACF Upgrades Shared UNIX Computers 27
Center for Applied Parallel Computing 28

Library Computing
CD-ROMs Networked at Bobst 29
Booking Media by Computer 29

Upcoming Events
Conferences of Interest 30

Summer '93 at the ACF
Important Dates for ACF Users 31
ACF Tutorials 32
ACF Microcomputer Workshops 34
Index to Tutorials and Workshops 34
ACF Summer Calendar 35