What's New on the NYU CWIS: Open Kiosks, Closed Classes, Study Cases, Aid, and Safety, 1

Geography Used to Link Data: ARC/INFO, Powerful Info System, Now at the ACF, 9

New in Scientific Visualization: Highlights and Visions from a Field in Ferment, 23

Spring '94 at the ACF: Schedule of Classes, Talks, and Workshops on Computers & Networks, 31-43

Academic Computing and Networking at NYU

Volume 4, Number 3
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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 312, 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 call 998-3038 or send e-mail to frederickson@acfcluster.nyu.edu 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 5 for information about opening an appropriate account.

This issue was prepared on Apple Macintosh Quadra and IIci computers, using Aldus PageMaker, Microsoft Word, Adobe Type Manager, and Adobe Photoshop. Fonts used in this issue are Palatino for the text and Gill Sans bold for headlines, along with Zapf Dingbats and Courier for special effects; the logo is set in Adobe Garamond bold italic. Camera-ready copy of text and screen shots was produced using a 600-dpi QMS 1700 printer. Color tabloid-size prints from a Tektronix Phaser IIIxi were used for preparing the cover; for the cover, and for many of the pages, negatives were made from digital output on disk. Echo Graphics printed and bound the newsletter.
What's New on the NYU CWIS: Info Kiosk, Case Abstracts, Grants, and More

David Ackerman
ackerman@nyu.edu

The NYU CWIS (Campus-Wide Information System) is expanding rapidly, as more and more units at NYU are making information available to the community on the CWIS. Financial Aid, the Office of the Registrar, and the NYU Security Office are just some of the departments that have recently added to the resources on the CWIS. The Academic Computing Facility, which has been developing the system at NYU, has also installed the first Campus-Wide Information Kiosk, to increase public access to the CWIS.

NYU CWIK: First NYU Campus-Wide Information Kiosk

The first NYU Campus-Wide Information Kiosk (CWIK) is now up and running. The University Information Center has teamed up with the Academic Computing Facility to offer easy access to the Campus-Wide Information System.

The NYU CWIS has been accessible to users of computers throughout the University since September. But since late December, even those who have...
**What Is the NYU CWIS?**

Developed and operated by the Academic Computing Facility, the NYU Campus-Wide Information System provides easy, menu-driven access to a growing online repository of current information about NYU facilities, programs, and events, and to a wealth of resources available via the worldwide Internet. Examples include electronic journals, research reports, and archives of scholarly materials, as well as hundreds of library catalogs around the world including those of NYU’s Bobst Library, Law, Medical and Dental Schools.

**Using the NYU CWIS Is Easy!**

You can connect to the CWIS from desktop computers in NYU offices and labs, or using a modem and ordinary telephone line from your home computer. If you have an ACF Electronic Mail and Information Services (EMIS) Account, select Info from the EMIS main menu; then, from the Info menu, select CWIS. (For more about the EMIS accounts — which are available to NYU faculty, staff and degree students — see the box on page 5.) Accounts on the ACF’s VMS and UNIX computers also provide access to the CWIS: type gopher at the system prompt.

When the NYU CWIS main menu appears, simply use the up- and down-arrow keys on your keyboard to choose the item that interests you, and press the Return key. Start by selecting the first item on this menu, for simple instructions on using the NYU CWIS and for information on CWIS highlights. Information can be read on-screen or E-mailed back to yourself for subsequent downloading and printing. When you’re done, simply type u to return to the previous menu.

**Further Information**

If you are interested in becoming an information provider to the NYU CWIS, or if you have any questions, you may send e-mail to cwis@nyu.edu (or simply cwis from the ACFcluster) or call the Academic Computing Facility HelpLine at (212) 998-3333.

Professor Lucas encourages contributors to submit abstracts via e-mail to itcases@stern.nyu.edu. (Detailed instructions can be found on the menus of the Information Systems Gopher server.) This collection should develop into a valuable resource for teaching Information Technology classes both at New York University and elsewhere.

The Stern Gopher server also provides a menu-driven link to the Harvard Business School Publishing Gopher server. This offers abstracts of cases (and other teaching materials) in a range of areas, in addition to Information Technology cases.

Facilities planned for the future include calls for papers, job postings, conference announcements, and other information of interest to students and faculty in the Stern IS Department, and to others.

**Financial Aid**

The Financial Aid section of the NYU CWIS has been completely redone. Within the last few weeks, new menus and information have been added. Because of the ease in updating electronic information, the Financial Aid Office was able to expand and update their information, while distributing it immediately to NYU students.

Look under the main menu item, Admissions, Financial Aid and Registrar, to find the Financial Aid section of the CWIS. Once inside, you will find deadlines for this academic year and next, a menu with application and other information, descriptions of
loans available, and answers to many (if not all) of your questions.

Check Course Offerings and Canceled/Closed Classes via the CWIS
A current list of canceled and closed classes for the Spring 1994 semester is now available via the CWIS, courtesy of the Office of the University Registrar. The list is updated frequently, so you can be sure of getting the most recent information if you're deciding which classes to register for. In addition, the Office of the University Registrar is making the entire listing of Spring 1994 courses available (divided by school), to be followed by the Summer 1994 listings.

Safety and Security
Safety and Security at NYU is a recent addition to the NYU CWIS menu. Here you will find important information and many useful tips compiled by the NYU Protection Services including emergency telephone numbers, telephone numbers and locations of police stations, and schedules of community patrols.

Here you will also find information and updates on other Protection Services activities that provide for the safety and security of the NYU community. For example, there are descriptions of new security technology, the Student Property Identification Program, and the Student Volunteer Protection Program under which local merchants have posted stickers in their windows identifying themselves as emergency student-assistance centers.

Music Business & Technology
Information about the Music Business & Technology Program in the School of Education has recently been added to the CWIS. The Music Business and Music Technology tracks are both here, along with faculty, facilities, and more. Select Academic Departments and Programs from the main menu, then choose Music Business & Technology.

MBT was able to add this information easily, by contacting the Academic Computing Faculty, and then using e-mail to submit it. They will be able to update it, when needed, in the same way.

Check the Weather on the CWIS
The NYU CWIS is now using the Illinois Weather Gopher to make the latest New York weather reports available to you. For New York weather select the main menu item, Information Sources: Phones, Places, and Publications, and then choose New York Weather. When you do, you will find a number of new and interesting items.

This convenient service includes the Daily Climatology Report (temperature and precipitation information), the Metropolitan Area Extended Forecasts, the Short-Term Forecast, and Zone Forecasts (by county). The University of Illinois Department of Atmospheric Sciences Weather Machine Gopher Server is updated so frequently that you will always find the latest forecast.

Coming Soon: GIGS (Grants in Graduate Studies)
The Graduate School of Arts and Sciences is assembling a collection of information that will be of great interest and utility to graduate students at NYU. Grants in Graduate Studies (GIGS), formerly a booklet published in alternate years, should be available in the NYU CWIS later in the spring semester.

GIGS will be an online, cross-referenced, up-to-date resource that lists internal and external funding opportunities for graduate students at NYU. Information will be categorized by the NYU Graduate (continued on page 8)

What Does a Gopher Go For?
What will a Gopher go for? Just about anything — any electronic file that is placed on a computer running the right software.

The word *gopher* has taken on a host of related meanings in the last couple of years, as the software developed at the University of Minnesota has proven its usefulness on the Internet. Gopher — named after the university mascot, punning on the phrase *go for* and the slang *gofer* — is several things. First of all, it is a *protocol* — a set of conventions for sending information on the Internet. The *Gopher server* software allows a computer to store and deliver the files; the computer itself is often also called a Gopher server, or just a Gopher — the Gopher at the University of Tennessee say, or the National Science Foundation’s STIS Gopher. Another component is the *Gopher client* software — one of several programs, such as TurboGopher, each designed to run on a specific type of computer, that allows you to sit at your computer and burrow through Gopherspace, going from menu to menu searching for the information you need. The latter process is often called *gophering*, from the informal verb *gopher*.

(For more about Gopher, see page 20 of the September 1993 issue of this newsletter.)
Mining the Internet’s Resources: Biologist’s Guide Available Online

Finding useful information among the vast resources of the Internet can sometimes be a daunting task. Fortunately, there is help if you know where to look. From time to time, we will try to help people working in specific fields find useful information in the Internet.

For example, biologists will be helped by A Biologist’s Guide to Internet Resources, by Una R. Smith of Yale University. The guide is updated monthly, and the most current version is available via Gopher, FTP (file transfer protocol), and e-mail. It contains information about both free and commercial databases, newsletters, and other information of particular interest to biologists.

To find the guide via Gopher, select Using External CWIS from the main NYU CWIS menu, and then go through the Geographical Index to North Carolina. Then select University of North Carolina at Chapel Hill (Gopher site archives). A quicker way is to simply type gopher sunsite.unc.edu at the system prompt, and you will connect directly to the UNC Gopher site archives. In that menu, choose Worlds of SunSITE, and then ecology+evolution. Or, from any gopher offering other biology gophers by topic, look for the menu item Ecology and Evolution [at UNC and Yale]. The guide is stored there in two ways: as a file for easy retrieval and as a menu for browsing.

To FTP, connect via ftp to rtfm.mit.edu and log on as anonymous, giving your e-mail address as the password. Use the cd command to go to the directory pub/usenet/news.answers/biology/ and use get guide to copy the file called guide to your computer. You can also connect via FTP to sunsite.unc.edu, where this guide is stored as pub/academic/biology/ecology+evolution/FAQ. You can also retrieve the guide by sending e-mail to mail-server@rtfm.mit.edu with no subject line and send usenet/news.answers/biology/guide as the sole line of text in the body of the message. Because the guide is long, you will probably receive it in parts: save each part separately, delete the e-mail headers, and merge them in a word processor into a single large document.

— Beth Kevles kevles@acfcluster.nyu.edu

<table>
<thead>
<tr>
<th>Subscribing to Discussion Lists and Electronic Conferences</th>
</tr>
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<tbody>
<tr>
<td>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</td>
</tr>
<tr>
<td>subscribe list_name your_name</td>
</tr>
<tr>
<td>replacing list_name with the appropriate list name (e.g., acsoft-1) and your_name with your first and last name — i.e., subscribe acsoft-1 mary smith</td>
</tr>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

### VMS
- Internet: in%"username @node"
- e.g., in%"listserv@vm.usc.edu"

### UNIX
- username @node
- listserv@vm.usc.edu
- listserv at vm.usc.edu

### CMS
- username at node
- listserv at vm.usc.edu
- listserv@vm.usc.edu

### Eudora and NUPOP
- username @node
- listserv@vm.usc.edu
- listserv@wumvd.bitnet

### BITNET
- in%"username @node.bitnet" username @node.bitnet
- e.g., in%"listserv@wumvd.bitnet"
- listserv@wumvd.bitnet
- listserv@wumvd.bitnet

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 arrive.
In the Communications Revolution, Who Wins, Who Loses?

In the coming communications revolution, who wins, who loses? Will megaconglomerates take over all media, restricting our access to information? In a November colloquium at NYU, W. Russell Neuman of Tufts University posed the question and discussed the possibilities. The speaker, who is the Edward R. Murrow Professor of International Communications at Tuft’s Fletcher School of Law and Diplomacy, envisions freer access for all.

We now have relatively few pipelines for information, each with its own carefully defended monopoly or near-monopoly: local phone and cable companies operate without competition in their own markets; newspapers and broadcast media generally do. Lowering the technological barriers between the various media would, as Professor Neuman sees it, most likely increase the access to information. Though a newspaper might be the only one in town, it would be in direct competition with the phone company, and the phone with cable, providing an overlapping ranges of services.

The technology of transmission is advancing the speed and breadth of the information flow: it is possible to send enough digital data over a simple twisted pair of telephone wires to compete with television; the boundaries between media are blurring. Similarly, the boundaries between countries are blurring, since the media technology doesn’t respect borders: a message on the Internet is parcelled into separate tiny packets that are sent over multiple random pathways toward the addressee, to be repeated as necessary and reassembled on arrival. Such a geodesic architecture, Professor Neuman points out, evades any attempt to impose border restrictions.

What should the government’s role be in this technological free-for-all? One thing it shouldn’t do is try to predict what the proper technology should be, since it evolves too fast. High-definition TV is a case in point: it was to be advanced through carefully devised standards. After much jockeying, standards were set. But the outlook for HDTV is dim, because its increased resolution isn’t visible to most people at normal viewing distances, and isn’t adequate for large-screen displays. Meanwhile, digital display and transmission evolve, and will probably outmode HDTV before it gets off the ground.

Professor Neuman sees the coming scenario this way: What with satellite transmission, cable, telephone lines, cellular phones, and normal broadcasts — all able to provide a broad range of overlapping services — there will be many pipelines for information into the home. The government’s role should be to keep the playing field level between the pipelines. Antitrust laws will have to be enforced to make sure the various sources compete.

So who wins? The consumers, the people who buy the products, since the costs will come down. The cost of a TV show is calculated at something like twelve cents per viewer per half hour. Therefore the viewer will be charged something like twenty-five cents — quite a tolerable amount, and a far cry from the present pay-per-view costs. Who else wins? The authors, the producers of the games and programs and books and plays. With the pipelines competing on hundreds of channels, there will be a tremendous competition for material.

The colloquium, part of a series on computers and communications, was sponsored by NYU’s Academic Computing Facility, the faculty of Arts and Science, the Courant Institute of Mathematical Sciences, the Interactive Telecommunications Program (Tisch School of the Arts), and the FAS Departments of Journalism, Politics, Sociology, and Computer Science, with support from Apple Computer, Inc.

— David Frederickson
frederickson@acfcluster.nyu.edu

Obtaining an EMIS Account
The ACF’s Electronic Mail and Information Services (EMIS) Accounts provide E-mail connectivity and network access — through the NYU CWIS — from your desktop computer to information resources at NYU and around the world. (E-mail is also available automatically to those with accounts on ACF mainframes and minicomputers.)

EMIS Accounts are available to all NYU faculty, research staff, and administrators, and to all students enrolled in degree or diploma programs. Simply apply at any ACF computer lab (see inside back cover for locations and hours). And, if you are unfamiliar with E-mail and network use, ACF classes and pamphlets will help you get started.

Faculty and staff members, if they prefer, may request EMIS Accounts by letter. Please use departmental letterhead with the department’s address and phone number, and include your name, title, and campus address and campus phone number. Please send your request to the Academic Computing Facility Accounts Office, Room 305, Warren Weaver Hall. For additional information on ACF computer accounts, please contact the ACF Accounts Office at 998-3035.
The Internet is a network of computer networks that by now connects over 15 million people in more than a hundred countries. It is a prelude to the Information Superhighway, which will link everyone at their homes, offices, and schools, and on the go — offering entertainment, shopping, education, and other services. People will be able to communicate and interact in this vast "cyberspace" — through e-mail, faxes, phone, and yet-to-be-defined multimedia conference tools. They will also have access to vast libraries and databases of knowledge in cyberspace to support education and learning. This vision is beginning to be realized on the Internet, as it grows at an astonishing rate and shifts from being a network of computers to being a network of communities.

The CyberTrek Project seeks to realize the vision by encouraging new cyberspace travelers to explore, understand, and learn about their own world and new cyberspaces through cooperative and thoughtful use of the Internet. The project began in January 1993 with the participation of Sherman Chen, Chris Zant, Amit Patel, and Ajit Kambil of NYU's Stern School of Business. Our mission, as members of the CyberTrek Project team, is to provide a vehicle with which to explore this vast electronic universe of data, allowing users to make "pit-stops" at destinations of their choice on their journeys through the Internet. The vehicle is the Internet World Discovery Tour — a software program, now in prototype, that will enable you to explore the network in a friendly way.

The Internet World Discovery Tour is a Macintosh HyperCard stack that provides a path through the Internet resources while providing information on the context in which those resources were created. It encourages learning about cyberspace as a human construct and resources are viewed as representing cultural artifacts. The project was born out of the frustrations of trying to access, discover, and use resources on the Internet. Hence the project team decided to build a flexible software tool to map current
and future resources on the Internet, focusing on the international potential of the network.

The Tour opens with a world map and a list of countries. On selecting a country, one is "beamed" to another country stack, which provides access to various categories of informational resources in that country: universities, culture, travel, environment, libraries, interesting computer servers, news, and business. In addition, this stack provides general information on the country, a map, and a summary of the Internet networking in the country.

Selecting one of the categories such as culture brings you down to the next level in the stack, where you can experience and explore different cultural resources. For example, we can envision language instruction being delivered over the network, perhaps through HyperCard-based lessons such as those presented by Professor Dilworth Parkinson of BYU at an NYU colloquium in March 1993 (see the May 1993 issue of the newsletter for more information on that colloquium). As a sample, we provide a multimedia audio clip of the Dutch translation of "Help! I am lost in Cyberspace." In addition we point to computer file servers where the resource is located. Similarly we can envision art, musical recordings and scores, theater, food recipes, beer and wine classifications to be available. Other categories provide similar pointers to related resources.

A key feature of our program is the ability to connect directly to a server of Internet resources using any of a variety of different programs: Telnet, FTP, Chat, e-mail, or a newsreader. Our objective is to make it easy for the user to directly access these programs and go to different locations in cyberspace.

This program differs from traditional programs for browsing and discovering Internet resources, such as Gopher, WAIS, and Mosaic. The key difference is that our program gives multimedia context information about Internet resources. Second, it focuses on the human aspect of geographical and cultural entities. Third, the program is uniquely organized, through the use of world and national maps, and with information categories going no more than three layers deep. This reduces the probability of getting lost in the program, and provides a structure to permit adding new information to the stack.

The map metaphor was inspired by The Power of Maps, an exhibition held last year at the Cooper-Hewitt Museum. Cartographers are very selective about the symbols they use and the subjects they choose for representation in a map. Similarly, we are selective in the mapping of emerging Internet resources, emphasizing resources that enhance understanding of different peoples and cultures.

The prototype that we have thus far developed provides information on only one country — the Netherlands. The flexible architecture of the program permits information for other countries to be added easily. We encourage the cooperation of others at NYU, the Internet, or the wider community, to contribute or coordinate information about a specific

(continued on page 8)
NCSA Mosaic: Coming Soon to a Monitor Near You!

Interest in NCSA Mosaic is sweeping the Internet. It is a user-friendly multimedia interface to the many resources on the burgeoning World-Wide Web (WWW), and users are adopting it in record numbers. (For more about WWW, see the article by Carol Hutchins in the November issue of this newsletter.) Recently the New York Times reported that Mosaic was causing traffic jams on the “Information Superhighway.” WWW and Mosaic begin to realize the promise of the vaunted National Information Infrastructure, but may well overstrain its present resources.

As it is, you need an up-to-date computer and a fast network connection if you want to use Mosaic.

Shown here is the prototype of a Home Page for NYU’s Academic Computing Facility, viewed with Mosaic on a Macintosh computer. This will ultimately serve as a guide to networked resources at NYU; clicking a mouse cursor on the various emphasized words (bold, italic, underscored, or highlighted, depending on the type of computer and monitor) will bring other pages of menus, documents, and images to the user’s screen. Version 2 of Mosaic for Unix computers has just come out, with improved interface and functions; the developers are working on upgrades for the Mac and PC platforms. Look for more about Mosaic in future issues.

An alternative WWW browser, available for use on ACF systems regardless of the type of computer and connection you are using, is called Lynx. Developed at the University of Kansas, Lynx is limited to simple text displays, but it provides a fast and easy-to-use way to explore resources on the World-Wide-Web. To use it, connect to ACFcluster, ACF2, or ACF4, and type the word lynx.

— David Frederickson

Internet World Discovery (continued from page 7)

NYU CWIS (continued from page 3)

School of Arts and Science Department, and the funding opportunities will be electronically cross-referenced.

By making this information available electronically, the Graduate School of Arts and Sciences will have the ability to continually update it. Formerly, it was possible to update it only every two years, when a new edition was released. Thus, graduate students at New York University will now have more timely information about grant opportunities.

Look for more information about Grants in Graduate Studies in the March issue of this publication.
The use of geographic information systems (GIS) grew dramatically in the 1980s. It is now commonplace for business, government, and academia to use GIS for many diverse applications. One such application is in fighting forest fires. At a recent meeting at ARC/INFO I saw a presentation of a GIS application for firefighting in California. The stands of trees, other combustibles, roads and firebreaks were all depicted as separate layers in the map. Fires could be simulated with passing time represented as successive frames on a workstation screen. The variables such as rain and the direction and speed of the wind determined the outcome.

It’s a powerful tool. GIS can help us address such important issues as problems growing out of rapid urbanization, the growth of surface transportation, the spread of diseases, and global climate change. It allows us to include ecological, social, and economic factors as well.

Broadly defined, a geographic information system is a computer system capable of holding and using data describing places on the earth’s surface. It is an organized collection of computer hardware, software, and geographic data designed to efficiently capture, store, update, manipulate, analyze, display, and print all forms of geographically referenced information.

**ARC/INFO**

ARC/INFO, from ESRI, is one of the most capable GIS programs, and the most sophisticated GIS acquired by the ACF. It has been installed at the ACF on two platforms in Warren Weaver Hall — on Archimedes, a Unix-based file server in the Visualization Lab (room 317), and on a PC running MS-Windows in the Innovation Center (room 201). ARC/INFO was an early entry in this important field, and now that its developer has implemented raster as well as vector map representation, its strengths are greater.

Maps are stored in two ways on computers — as vectors (points and lines) and raster images (points only, to be printed as dots or shown on the screen as pixels). The vector method uses less memory: a line across the screen is stored by keeping track of the two endpoints. The raster method requires that each A map represents a three-dimensional area, and the vertical dimension can be exaggerated to help the geographic analysis. The U.S. Attorney’s Office used this map in a property condemnation case in Sacramento, Calif. Numerous vantage point visibility analysis maps of this type were created to show that a proposed development would be visible from a protected recreation area.

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**VISIBILITY ANALYSIS MODEL**

PROPERTIES A, B, C, G2 AND J

[Map showing visibility analysis model with properties and vantage points marked]
The state of Washington uses ARC/INFO for its Growth Management Services data analysis. The image in the upper left corner is an index to the eight layers that make up the map; three of them are shown here. Each of those layers is made up of a number of component layers. The bottom right image, for example, indexes the transportation layer, with components such as traffic incidents, arterial traffic volumes, high-impact traffic intersections, and transit routes.

Pixel (the smallest unit of information in a computer image) be marked as being on the line, and each pixel has to be stored in memory. ARC/INFO is based on vector data structures. Each feature is stored as vectors — points described as X-Y coordinates, and information about the lines connecting them. The features can be represented as points, straight lines, arcs, or regions. Attributes — the characteristics or the data that we will use in our analysis — are associated with specific features. In a raster data structure, the attributes are associated with a grid cell.

ARC/INFO is made up of several subsystems; each handles a different function. They are Arc, ArcEdit, ArcPlot, Librarian, Info and Tables. The Arc Macro Language (AML) allows you to communicate in any of the modules. Extensions to ARC/INFO include CoGo — for applications involving accurate coordinate geometry; Network, for linear modeling; Tin, for surface modeling; and Grid, for applications requiring raster-based grid-cell analysis.

ARC is the overall GIS manager from which we move to the various subsystems listed above. These subsystems are where we do such back-office GIS work as manipulating coverages — the individual layers of a map, each of which is a set of thematically associated data considered as a unit. A coverage might be the lines representing streets or the invisible boundaries in a zoning map. Editing coverages — or to keep them current, to include new information, to create subsets that join several coverages for a map needed by a researcher — is the job of the cartographer-programmer.

AML is a high-level, algorithmic, full programming language with a set of tools for building menus and tailoring user interfaces for specific applications. Using AML, the programmer would create a user-friendly package for the researcher or the city planner. For a programmer to come up to speed with ARC/INFO involves considerable work. (Another GIS, Atlas GIS, is less complex; it is available for use at the ACF labs and its Innovation Center in Warren Weaver Hall. We also plan to acquire MapInfo in time for a summer course.)

**ArcView**

ArcView is the quick and easy module from ESRI to view, manipulate, print, and query geographic data (meanwhile, ARC/INFO would be used to maintain a project’s data and to prepare the data for the non-programmers to use ArcView). Many of the functions available in ARC/INFO are available to a nonprogrammer in ArcView, but the maps and coverages must already exist for ArcView to be useful. Learning ArcView is not a minor investment in time, but the skilled user will have powerful tools to perform sophisticated inquiries, explore extensive areas of geography, merge PC and workstation databases, and produce high-quality, full-color maps.

Tami Strauss — staff assistant in cartography for the Department of Planning of Westchester County and a student in the Graduate Public Administration program at NYU’s Wagner School — is arranging for the NYU community to have access to the Westchester County Planning Department’s current library of ARC/INFO maps. Over thirty political themes such as school districts and zoning, hydrology, waste sites, geology, and roads will be archived at the ACF. Ms. Strauss will present these maps and discuss what went into making them, using ArcView, in a talk at the ACF in March. The demonstration will be the first of a two-part GIS series; in the second, I will give an introduction to ARC/INFO. (For details on the presentations, see the schedule section at the end of this issue.)
Recent Census Material Available at the ACF Data Base Archive

Frank LoPresti
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Census enumerations, giving historical and contemporary population characteristics from 1790 to 1990, are useful datasets that may be ordered from the Inter-University Consortium for Political and Social Research (ICPSR) through the ACF’s Data Base Archive (see box for details). Because the Census datasets are so popular among researchers at NYU, once a file has been ordered, the ACF keeps it on a tape cartridge and catalogues it in a public catalog on the IBM-mainframe Wylbur system, so that the next faculty member or student needing the data need not have to wait for an order to ICPSR to be processed. To find out what is available and to get help on using the data, enter HELPME DATABASE on the IBM Wylbur system.

New Census Datasets

Census data products include Public Law 94-171 counts, Summary Tape Files (STFs), Public Use Microdata Sample files (PUMS), and other special files such as Equal Employment Opportunity (EEO) data files.

The Public Law 94-171 data reflect the 1975 Congressional mandate to the Department of Commerce to have the Census Bureau provide each governor and legislature with the population data needed to redraw legislative districts. These files are the headcounts of the citizens used to create these districts. The files contain information grouped by standard census geographic areas, such as counties and census tracts, but will also group the headcounts by political units requested by each individual state, or process the counts in an innovative manner. For example, in an experiment requested by the state of California for the 1990 census, the Los Angeles County data was processed to produce computerized automated maps. These data, sorted by voting districts, are available from ICPSR (study number 8882).

The Summary Tape Files aggregate the responses both to the short Census questionnaires we get in the mail and to the long forms used in door-to-door interviews. These files have between one and eight thousand cells of population and housing counts and characteristics aggregated into geographic areas such as states and counties down to census tracts (perhaps a thousand persons per tract). Items include sex, age, income, plumbing facilities, vehicles, and number of bedrooms. Since these are aggregate counts, it is not possible to find information about any one individual.

On the other hand, the PUMS files contain a sample

The ACF’s Data Base Archive (DBA) acquires and stores data files for instructional and research purposes at NYU. Assistance in the use of these data files is provided by DBA staff to NYU faculty, researchers, and graduate students. The DBA currently holds and catalogs some 700 studies represented by over 2400 data files. More are being acquired continually at the request of researchers at NYU. For further information on the DBA’s services, or for help in making use of them, please contact ACF consultants Frank LoPresti (998-3398) or Bob Yaffee (998-3402). Also see “Locating and Using Social Science Data Collections at NYU” in the September 1992 issue of this newsletter. Full descriptions of DBA holdings may be seen by typing HELPME DATABASE on WYLBUR, or help database on the ACFcluster, or by speaking to the DBA staff.
of individual long-form census records showing most population and housing characteristics, but with any identifying information removed in order to preserve individual confidentiality. The Equal Employment Opportunity Special File shows detailed occupation and education data by age, cross-tabulated by sex, Hispanic origin, and race.

Problems with Census Data

There is a flurry of activity at the Census Bureau about the PUMS data. A new error was found, and a decision must be made at Census whether to reissue or to notify users as to the extent of the error. The problem results from errors for group quarters (nonfamily). The data seem to have errors in some geographic fields, such as place of work and place of migration for individuals within these nonfamily groups. The group quarters in question are dorms, halfway houses, group housing for adults in drug programs, and the like.

This would be the second major problem with the 1990 PUMS data. This spring, another problem was found in geographic variables, and as a result, Census decided to reissue the data. The file is hierarchi-

Gopher Access to the ICPSR Catalog

Anyone with an ACF EMIS account may now access the ICPSR catalog using Gopher and the NYU CWIS. I am impressed with the results of the Gopher searches. Until recently, the secondary names for data sets were useless when using the ICPSR Guide to Resources and Services, a large catalog guide in book form, but now point directly to the data set. Once logged on to the ACF through your e-mail account, the following steps will take you to the ICPSR catalog.

1. Choose Info..Campus-wide Information System and other Internet resources from the main EMIS menu
2. Choose NYU CWIS.. Connect to NYU Campus Wide Information System (Gopher)
3. Choose Library Facilities and Catalogs
5. Choose ICPSR Research Catalog and you will be allowed to make string searches for words used in the ICPSR data set’s description.

If you have a full VMS or ACF Unix account, enter gopher at the prompt and then select Library Facilities and Catalogs and proceed as in the above description.

ACF Helpline Q&A

Q: What is an alias? Can I create one using my EMIS account?

A: An alias is a short nickname for a long E-mail address. It's easy to make and easier to use.

You can save time and keystrokes by entering the alias on the address line of an outgoing message. When you send the message, the computer will supply the full address.

To make an alias, follow these steps:
• In the main menu, choose 4. Tools.
• In the Tools menu, choose 9. Aliases.
• In the Alias menu, choose 2. ADD... create a new alias.
• You will then be prompted for the E-mail address you want to make an alias for. Type it in — say rosenblattj@computer.somewhere.edu — then hit Return. (An alias can also refer to more than one address; simply insert a comma before each successive address after the first.)
• Next, you will be prompted for the alias you want to use for the address or addresses you just typed in — say auntjane or bridgeclub. Again, hit Return.
• Finally, you will be asked whether you want this alias to be public or private. If you are the only one who is going to be using this alias, type private at this prompt.

The alias is now ready to use after in% in place of the full e-mail address.

So next time you want to send a message to Aunt Jane, enter send at the MAIL> prompt, then type in%auntjane at the To: prompt. But if you also want to send copies to the rest of the bridge club, enter send/cc at the MAIL> prompt, give Aunt Jane’s alias as above, then type in%bridgeclub at the CC: prompt.

Call the ACF HelpLine at 998-3333
UnCover and FirstSearch Databases Available Online

Lucinda Covert-Vail
covertvl@acfcluster.nyu.edu

Now you can search a number of research databases from Bobst Library or computer labs around campus, or in the convenience of your own home or office. The NYU Libraries are continuing to expand the number of databases available for online access from outside of the library and are eager to learn your opinions and search experiences.

A valuable resource, these databases can support research for theses, dissertations, term papers, lab work and experiments, as well as faculty research and curriculum development. In addition to providing traditional subject access to periodical articles, some of the databases provide a document-delivery service and a table-of-contents service for quick, current awareness information. For information on any of the database services now offered, please contact me, by e-mail at the address above or by phone at 998-2497.

UnCover
The UnCover database is a multidisciplinary periodical index offered through CARL, a Denver-based online network. Access to the database is free and coverage includes over fourteen thousand popular and scholarly journals. In addition to keyword searching for specific subject-related articles, you may use UnCover to view the table of contents of a particular journal title or issue. UnCover also offers a fee-based document delivery service that will deliver the full-text of the article, by fax, to your home or office. Access UnCover on the Bobst Library portion of the NYU CWIS (see article on page 1) or you may telnet to it directly at database.carl.org.

FirstSearch
The FirstSearch family of online databases is in preview here at NYU in February and March. All FirstSearch databases utilize the same user-friendly search interface, and many will seem familiar because they are electronic versions of your favorite printed indexes such as Art Index or Business Periodicals Index. Many FirstSearch databases also offer a document delivery service. The FirstSearch databases

FirstSearch Databases

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Lucinda Covert-Vail is Director of Reference and Information Services at Bobst Library.
Please Copy This Disk

If you would like to use information and electronic texts that are available on the Internet, but you or your students don't have easy network access, then Please Copy This Disk may be the answer for you. This text-distribution program was launched last year by the B&R Samizdat Express, a small New England book publisher, and Global Education Motivators (GEM), which manages the UNISER database of the United Nations Department of Public Information. These two independent companies obtain a wide variety of public-domain books and information from various Internet sources, and provide this material on IBM or Macintosh disks so you can easily use and copy it.

The texts for the disks are obtained from a variety of sources on the Internet, from Project Gutenberg to the Library of Congress. All of the disks can be purchased individually for $10 apiece. Each contains the equivalent of hundreds of pages of text. Most of this information is provided as plain, unenhanced text, which you can easily import into your word processor. The texts are all public-domain or freely available, and they are provided as they are found on the Internet.

The material is provided on disks for either IBM or Macintosh computers. The IBM-format disks include a public-domain program, READ.EXE, from the U.S. Department of Commerce that makes it easy to read documents and search for the passages you want.

The ability to copy the disks means you can use a disk as a substitute for textbooks; custom-make your own anthologies by taking excerpts from several disks; make electronic copies quickly and cheaply instead of paper copies; and give these same benefits to colleagues. This service is intended primarily for teachers, librarians, and students, but is available to everyone. The purchasers of the disks are encouraged to copy them and freely distribute them to colleagues and students, who in turn can do what they want with their copies, at no extra cost.

Please Copy This Disk is a relatively new service, and by January, 1994, the list included 179 disks, with topics ranging from NAFTA and NATO to Black History to Shakespeare to the Bible to the number Pi.

For more information, write to the B&R Samizdat Express via e-mail at samizdat@world.std.com, or at P.O. Box 161, West Roxbury, MA 02132.

— from information supplied by B&R Samizdat Express

How Do You Cite an Internet Document?

Preparing bibliographies and footnotes is a necessary but tedious task for anyone doing scholarly research. Style manuals give precise rules for citations of traditional materials such as books, journals, and archives. But when you have to cite electronic information, the territory is not so well charted. How do you cite electronic information?

This problem is tackled by Xia Li and Nancy B. Crane in the book, Electronic Style: A Guide to Citing Electronic Information. Li and Crane attempt to establish a useful and standard method of citing electronic resources such as full-text information files, bibliographic databases, Internet-accessible electronic journals and discussion lists, e-mail, bulletin-board systems, and commercial online documents.

Electronic Style is available from Meckler Publishing, 11 Ferry Lane West, Westport, Conn. 06880, telephone (800)-632-5537. It is also available at the NYU Computer Store.

TEXT Technology to Expand TEXT Technology, a journal designed for academic and corporate researchers, writers, editors, and teachers, will be substantially expanded, starting with Volume 4 (the 1994 calendar year), and they are looking for additional book or software reviewers.

TEXT Technology publishes articles and reviews about all facets of using computers for the creation, processing, communication, and analysis of texts. The quarterly journal contains timely reviews of books and software, discussions of applications for the analysis of literary works and other texts, bibliographic citations, and much more.

Submissions of articles are welcome, and should be sent as ASCII files via e-mail to JohnsonE@columbia.dsu.edu. Authors will normally receive notices of acceptance and referees' comments promptly via e-mail.

Subscriptions cost $45 for individuals. Contact LangnerS@columbia.dsu.edu for more information.

FirstSearch (continued from page 13) are available for access in all three Bobst reference centers and through your ACF EMIS Account. For more information on FirstSearch, contact the author.
I SEE! Colloquium on NYU-Developed Software to Teach Statistical Inference

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The NYU developers of a new program for teaching basic concepts of statistics presented it at a colloquium on November 5 in Warren Weaver Hall. The event was one of a series of colloquia on uses of computers and communications co-sponsored by the Academic Computing Facility and the Faculty of Arts and Sciences.

Professors Richard Maisel and Caroline Persell (Sociology, FAS) discussed and demonstrated a computer program that helps students understand the process of statistical inference. Statistics and statistical inference are increasingly important tools for students in the physical and social sciences, as well as in such other areas as education and business. Yet learning the concepts involved can be difficult for students with modest backgrounds in mathematics.

The PC-based program, developed with the help of Eray Ekici (now with the Academic Computing Facility), is called ISEE — Introduction to Sampling Error Experiments — and allows students to learn about sampling distributions by experimenting with different methods of sampling from a known population. Population data are provided with the program, but users may also enter their own data.

ISEE (and its graphical sibling, ISEEG) can be used effectively in several different ways — by an instructor, either in a lecture-demonstration or interactively with the students in a computer-equipped lab, or by the students independently. The program is now used for coursework in the Department of Sociology.

The Social Context
Professor Persell spoke first, discussing some of the pedagogical reasons for developing the software, some of the means used, and some of the lessons learned.

Support, she stressed, is important when one is developing software — technical and social support from the other members of the team and others in the department, and financial support from the department, the university, and outside sources — since the project is bound to take more time and effort than anticipated. Local support encourages outside funding — in this case, a FIPSI grant — and the funding legitimizes the local support.

As the software was being developed, the team continually tested it with students (while comparing the test group's progress against a control group), and used the feedback to modify the program. This inevitably meant that the formal evaluation was some-
what out of date by the time it was completed. Evaluation is necessary and helpful, but it’s not easy to find a time that’s neither too soon nor too late.

Clear Objectives, Clean Screens
Any software being developed must of course answer a clear pedagogical need. Professor Maisell prefaced his demonstration by noting that the many students feel uncomfortable about taking statistics courses in the first place; after the easy sailing of the initial sessions, they tend to hit a stone wall when they encounter the theory of statistical inference. That, then, provided the objective: to teach inference and sampling in a way that would ideally lead the students to discover the principles for themselves.

At the outset, the developers decided on a few basics: to keep the interface as simple as possible, with everything visible on the screen and no pull-down menus, and to make the screens for the five subsidiary modules as similar to each other as possible. ISEE thus presents the user with a simple screen (see illustrations). The main window covers roughly the upper two-thirds of the screen, with the lower third reserved for a menu box on the left and a larger space for commands, definitions, and data entry on the right. Parameters and commands entered below launch calculations whose results are shown in the main window.

Copies of the software and manual are available to members of the NYU community at a very nominal fee to cover the costs of the media.

The presentation was part of a series of colloquia sponsored by the ACF, the Faculty of Arts and Science,

(continued on page 17)
Free and Low-Cost Software for Teaching Mathematics Available on the Internet

If you teach mathematics in high school or college, you can find helpful instructional software and reviews online. The Mathematics Archives contain numerous programs, most of them written by teachers, to help explain or explore mathematical concepts and procedures, along with reviews and abstracts of both shareware and commercial programs. You may download and try out the shareware programs at no charge; for some, there is a charge if you wish to continue using them.

The archives were previously housed at Washington University in St. Louis (see our January 1993 issue for more information). But under funding by the National Science Foundation, they have recently been moved to the University of Tennessee, where they are housed on the server archives.math.utk.edu.

The archives contain programs for both the Macintosh and the PC, and they range from full-course software to smaller modules, including a program for generating fractal landscapes, a function-graphing program, a scientific plotting and data-analysis program, and a calculator designed to do computations on large integers.

You can retrieve the programs either via anonymous FTP or Gopher, using the NYU CWIS (see the article on CWIS in the Networks section). Gopher is preferred; it allows the Math Archives to retrieve mathematical packages archived at other sites, and to link to other Gopher sites of interest to mathematicians. To reach the archive, select Using External CWIS from the main NYU CWIS menu, then Geographical Index, then North America, then USA, then Tennessee, and finally University of Tennessee, Mathematics Archives. Alternatively, connect via FTP (file transfer protocol) to the server address given above; when prompted for username, type anonymous, and for password, enter your e-mail address.

If you have suggestions or comments on the archives, or software or reviews you think should be included, contact one of the directors, Earl Fife (fife@calvin.edu) for Macintosh material or Larry Husch (husch@math.utk.edu) for DOS.

New Educational Discussion Groups of Interest

Researchers in education and related fields now have a forum on the Internet. The American Educational Research Association (AERA) and the College of Education at Arizona State University have recently created eleven LISTSERV forums, corresponding to the eleven AERA divisions. (For information on subscribing to discussion groups, see the box “Subscribing to Discussion Lists and Electronic Conferences” in the Networks section.) The lists, AERA-A through AERA-K, represent the following divisions of the association:

- AERA-A (Administration)
- AERA-B (Curriculum Studies)
- AERA-C (Learning and Instruction)
- AERA-D (Measurement and Research Methodology)
- AERA-E (Counseling and Human Development)
- AERA-F (History and Historiography)
- AERA-G (Social Context of Education)
- AERA-H (School Evaluation and Program Development)
- AERA-I (Education in the Professions)
- AERA-J (Postsecondary Education)
- AERA-K (Teaching and Teacher Education)

To subscribe to a discussion group, send an e-mail message to listserv@asuvm.inre.asu.edu with the body of the mail containing the one-line command (be careful not to type the word area by mistake):

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sub aera-x your actual name
e.g. sub aera-b Horace Mann
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You may place multiple subscriptions on separate lines. If you have any questions, contact Gene V. Glass at glass@asu.edu or at (602) 965-2692.

Census Data (continued from page 12)

Summary Tape 4 and the Subject Report Files, thick tomes on particular subjects available in electronic form. Six are planned for the 1990 census.

From Tape to CD to Internet

In previous articles, I’ve written about ICPSR moving to more modern media. The latest development is that they are planning to install arrays of CD-ROM jukeboxes from which consortium members can retrieve files via FTP (file transfer protocol) over the Internet. This means that, after arranging through the DBA for direct access, researchers would order data over an Internet-connected NYU computer and receive it moments later. ICPSR sees the Internet, with its pipeline for digital data, as the future, rather than physically transported CDs or floppy disks. We are leapfrogging those physical media as we move away from mainframe computer tapes.

I SEE! (continued from page 16)

the Courant Institute of Mathematical Sciences, and the FAS departments of Computer Science and Sociology, with support from Apple Computer. Individual presentations are co-sponsored by other University departments, depending on topic. For more information on the colloquium series, please call 998-3333.
Remembering Max: Memorial and Scientific Talks Honor Memory of Max Goldstein, First ACF Director

Family, friends, and colleagues of the late Max Goldstein, the first Director of NYU’s Academic Computing Facility, gathered on December 3, 1993, to honor his memory with reminiscences and with technical talks on subjects in which he had a special interest. Professor Goldstein came to NYU in 1957 to direct the Department of Energy computing center at the Courant Institute of Mathematics (CIMS); he was instrumental in forming the Department of Computer Science in 1969, and was a charter member of its faculty; and, while continuing to teach computer science, directed the ACF from the time it became a separate entity in 1980 until he retired from that position in 1990.

Many of Professor Goldstein’s former colleagues spoke warmly of their experiences in working with him, among them S. R. Srinivasa Varadhan, CIMS Director; Sylvia Baruch, NYU Deputy Chancellor; Professors Peter D. Lax and Jacob T. Schwartz of CIMS; Jay Blaire, Executive Director of the San Diego Supercomputing Center; and three current members of the ACF: Edi Franceschini, Special Advisor to the Director; Edward R. Friedman, Science Coordinator; and George Sadowsky, Director.

Technical Talks

Professor Herbert B. Keller — once Professor Goldstein’s Associate Director at the AEC computing center at CIMS, and now Director of the Center for Research on Parallel Computing at the California Institute of Technology — spoke about numerical experiments on lattice points, the points where lines of a grid intersect. A classic problem proposed by Gauss seeks to estimate the number of lattice points inside a circle of a given radius — a question that figures in many problems of physics. By comparing the area of the circle with the number of lattice squares contained in the circle, Gauss concluded that the number of points approaches the figure for the area. The question is, how close does it approach? Can the difference be estimated with any accuracy? Professor Keller enumerated the various theorems that have, over the years, refined the estimate, and told about the progress he and his colleagues have made in refining it further.

The second technical talk was given by Malvin H. Kalos, who was at CIMS from 1964 to 1989, and now directs the Cornell Theory Center. He discussed the issue of scalability in parallel computing. Theoretically, parallel computing offers the possibility of increasing computational power simply by adding more and more processors to an original array. If they could work in isolation, the increase in power would be proportionate to the increasing number of processors; however, since the processors must trade information throughout a calculation, efficiency suffers accordingly, and a point of diminishing returns is reached as the array gets larger. To be truly scalable, Professor Kalos emphasized — and useful for practical applications in business and industry — the software for parallel computations must be able to add processors without reprogramming.

— David Frederickson, with Anneli Lax (CIMS) and Edward Friedman

Nominations Invited for This Year’s Max Goldstein Prize

Nominations for the Max Goldstein Prize for Undergraduate Creativity in Computing for the 1993/1994 year are now being solicited. The award has been established in honor of Max Goldstein, the first director of the Academic Computing Facility.

Each annual prize consists of a cash award of $500. The prize will be awarded yearly to an NYU undergraduate who has applied computing in a creative and practical way to improve the academic, cultural, or social life of either the University or the community; any student in any degree program is eligible. Nominations for the Max Goldstein Prize should be submitted to the Director of the ACF, George Sadowsky, and should state the name of the nominee, a description of the nominee’s accomplishment, and how the accomplishment satisfies the criteria for the prize. Nominations will be evaluated by a committee composed of members of the Courant Institute and Dr. Sadowsky. Nominations should reach Dr. Sadowsky by March 15.
Supercomputing '93: Latest Evolutions in High-Performance Computing

Edward Friedman
friedman@acfcluster.nyu.edu

Last November in Portland, Oregon, the conference called Supercomputing '93 attracted nearly six thousand people from both domestic and foreign universities, research laboratories, government agencies, business, and industry. They came to learn about and discuss the latest developments in this leading-edge and ever-changing field of advanced computing and its associated technologies.

Academics, researchers, industrial scientists, engineers, and practitioners presented papers, participated in panels and forums to discuss topics of interest in computer science, the computational sciences, networking, and data communications. Tutorials and workshops — ranging from basic to advanced topics in high-performance computing and high-speed communications — were presented by teams of experts and specialists from all fields.

The federal government continues to fund and provide leadership in defining national goals by stressing the importance of advanced research and development projects in science and technology.

Following this lead, business and industry play a strategic role in developing new advanced technologies for computing and communication. Representatives of participating firms displayed their products and described their planned projects. Through these, they hope to meet the ever-increasing demands of government and academic leadership, as well as those of society at large, which is likely to utilize the results of these revolutionary technologies for education, information, and — not least — entertainment.

Numerous workshops and tutorials were offered for everyone from primary-school teachers to computational scientists. Full-day and half-day tutorials covered subjects ranging from an introduction to high-performance-computer architecture, software, and algorithms to such specialized topics as the use of the C++ programming language in high-performance computing.

Special emphasis was placed on parallel computing and computers, and on the languages and paradigms needed to program them effectively. There was also a great deal of interest in a course on how to work with clusters of workstations, using the software PVM (Parallel Virtual Machine) conceived and developed by researchers at the University of Tennessee, Oak Ridge National Laboratory, and Emory University. Several versions of PVM are available at NYU on a cluster of IBM RS/6000 workstations [configured as a parallel system] and operated by the Center for Applied Parallel Computing, an ACF resource.

Latest Hardware Exhibited

On the exhibit floor, major vendors such as Cray Research, Cray Computer Corporation, Thinking Machines, IBM, Intel, Silicon Graphics, NCUBE, Masspar, Kendall Square Research, Fujitsu, and NEC presented and demonstrated their latest offerings of powerful multiprocessor parallel machines. All of the above machines are capable of providing hundreds of megaflops (millions of floating-point operations per second), and many claim gigaflop (billions of flops) performance. Vendors including IBM, HP, DEC (Digital Equipment Corp.), and SGI (Silicon Graphics, Inc.) also offered systems based on individual workstations, linked either by conventional connections such as Ethernet or FDDI, or by specialized intercon-
The keynote speech at Supercomputing '93 was given by Dr. Neal Lane, Director of the National Science Foundation (NSF). He described the role that the NSF has played over the last forty years in the area of high-performance computing. Although the NSF has long supported computing, during the last ten years the agency “took on an entirely new character,” in Lane’s words, when it “came to recognize that advances in computing technology and applications had made the computer an essential basic research component in virtually all disciplines of science and engineering.” He felt that the “academic community was being held back by a lack of access to the necessary computing power.”

He gave tribute to the Lax Report, a 1982 document whose principal author was Professor Peter Lax of the Courant Institute of Mathematical Sciences at NYU. The report, Large-Scale Computing in Science and Engineering, “provided the framework and the blueprints for the NSF’s program in advanced scientific computing.” Later work sought to achieve three major goals of the Lax Report:

- To establish a group of national supercomputing centers, working with industrial collaborators, and to connect them through advanced networks.
- To develop a relationship between academia and computer manufacturers, making sure that academic freedom and property rights were protected.
- To establish interdisciplinary groups at universities to collaborate on common problems, share software, and create a versatile equipment base for research and education.

Those initiatives have been more successful than anticipated. Four national supercomputing centers are firmly established; they give more than fifteen thousand researchers access to the most advanced computer and communications resources available. There are over eighty industrial firms that have partnerships with the centers. Powerful software and specialized resources are all clear results of the NSF investment — software such as NCSA Mosaic, the Cornell Theory Center’s Scientists’ Workbench, and SDSC Image Tools, and resources such as a center focused on biomedical research at the Pittsburgh Supercomputing Center.

Dr. Lane outlined some of the NSF’s future goals by describing the newly commissioned Branscomb report (after Lewis Branscomb of Harvard University) From Desktop to Teraflop: Exploiting the US Lead in High-Performance Computing. It addresses “improving access to high-performance computing resources, developing algorithms, software, and computational techniques that take full advantage of parallel capabilities, and managing advanced computing resources.”

The NSF director concluded with a brief description of the NII, National Information Infrastructure as “the kind of grand vision that can capture the nation’s imagination.” As it expands, the NII is expected to integrate the existing computing resources and the machine-resident information currently available over networks around the world.

The recent overwhelming success of NCSA Mosaic (see page 8 for a report on NCSA Mosaic) as a program for navigating the Internet, coupled with ever-expanding information servers around the globe, has demonstrated that this goal of broad integration is rapidly becoming a reality. Mosaic is so useful and powerful that demand is building for it; however, it uses network resources so heavily that it is likely to rapidly consume the bandwidth of existing networks. If network capabilities — both local and wide-area — aren’t expanded and deployed rapidly, it is possible that users will face Internet gridlock.

If you would like an electronic copy of either the Branscomb report or Dr. Lane’s speech, you can retrieve them through the NYU CWIS (see article on page 1 for more about the CWIS). From the main menu, go to Academic Computing and Networking Resources, then Academic Computing Facility, then Science and Visualization Resources, where the papers will be found among other National Science Foundation Resources. The Branscomb Report is also on the NSF’s own Science and Technology Information Service (STIS) Gopher server; to connect, type gopher stis.nsf.gov 70 at your system prompt.

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nects known as switches. The Allnode switch from IBM — the one currently in use on the ACF-IBM RS/6000 Cluster — was on display. IBM has put together a machine known as the SP-1, consisting of boards made up of RS/6000 RISC chips and a proprietary switch, and is promising an even more powerful SP-2 in the near future. Cray Research, in collaboration with DEC, has built a machine based on DEC’S powerful Alpha processor. Hewlett-Packard and Convex have produced a machine that uses HP PA-RISC workstations as an attached multiprocessor to a Convex multiprocessor vector machine. Silicon Graphics
High-Performance Computing and Communication

It may be useful to summarize some concepts that underlie the descriptions in this article.

Hardware Technologies

Parallel computing — computing performed on systems where many processors work concurrently on solving problems — is developing rapidly. In the past, only a handful of manufacturers and major research laboratories could afford these technologies. Manufacturers of these systems included Cray Research, Cray Computer Corporation, IBM, Intel, Thinking Machines, and a few others. These large systems, designed and built for use on computationally intensive problems in the physical sciences and engineering, are expensive, both to buy — generally $1 million or more — and to maintain.

But less expensive systems became possible once high-performance RISC (reduced-instruction-set computer) chips started being used in relatively low-cost workstations. It became possible to put together a high-performance multiprocessor system by clustering together many RISC-based workstations into a single logical parallel machine. Although not as efficient as a real multiprocessor supercomputer, a cluster can be assembled at a relatively modest cost (in the neighborhood of $100,000 or less), and can be expanded or have components replaced as funds became available. It also offers the attractive advantage of being potentially scalable — that is, it can be enlarged to any size without changing the configuration in any major way — and provides an environment well-suited to university use. Experiments and simulations could readily be carried out by computational and computer scientists. Such a cluster also provides a suitable instructional environment for teaching the concepts of parallel computing. Excess cycles of the processors within the cluster could be made available for the computationally intensive applications of the physical and life sciences — whose needs, at most research universities, seem limitless.

Software Developments

A large variety of software is being offered for parallel or multiprocessor operations layered on top of the basic UNIX-style operating systems. Most notable are PVM and its variants, Network Linda, Parasoft Express, Fortran 90, and HPF (High-Performance Fortran — a superset of Fortran 90). These are either libraries of routines that can be used with high-level languages such as C or Fortran, or are language processors and compilers. Two vendors offer automatic parallelizing tools: APR (Advanced Parallel Research) has Forge 90, coupled with an automatic parallelizer for both distributed- and shared-memory computers; and KAP from KAI (Kuck & Associates) offers an automatic parallel optimizer. Microsoft now offers a Fortran compiler for use on the powerful Intel Pentium processor, and NCR exhibited a system based on Microsoft NT that can run jobs on two Pentium processors.

The ACF has most of the software listed above. KAP is available on the KSR systems accessible to the NYU community at both the Cornell Theory Center and the North Carolina Supercomputer Center.

Networking Technologies

Many vendors showed technologies to interconnect processors. Some of these approaches offer extremely high-speed interconnections between processors and nodes on local networks and other nodes on other networks on the Internet. A discussion revealed the usefulness of the ARPA/NSF Gigabit Network...
Two Joint Testing Projects: Infrastructure & Storage

Two major collaborative projects are testing ideas and equipment needed for high-performance computing and for the evolving high-speed network.

The National Information Infrastructure Testbed
The National Information Infrastructure Testbed (NIIT) is an industry-led group of corporations, universities, and government agencies announced on November 18, 1993. It will permit users and scientists to interact in real time by integrating distributed networks and systems.

The mission of the NIIT is to create new jobs and new business opportunities, and to spur the growth of an information industry. It will use existing technologies to access information in diverse locations, and will combine them in new ways to build the information infrastructure industry. It represents one of the first major uses of the National Information Superhighway promoted by the Clinton Administration. Participants in the NIIT include AT&T, the Department of Energy’s Sandia and Lawrence Livermore national laboratories, DEC, Ellery Systems, Inc., Essential Communications, Hewlett-Packard, Network Systems Corporation, Novell, Sprint, SUN, SynOptics Communications, University of California at Berkeley, College of Ocean and Atmospheric Sciences, Oregon State University, Ohio State University, the University of New Hampshire, and the Smithsonian Astrophysical Observatory.

National Storage Laboratory
The National Storage Laboratory (NSL), a collaboration launched in 1992 at Lawrence Livermore National Laboratory (LLNL), includes collaboration with many industrial partners and laboratories of the Department of Energy and the NSF, as well as the US Patent and Trademarks Office.

Broadly, the purpose of the NSL is to improve access to the expected rapid growth of information generated by large scientific, commercial, and digital library applications. The supercomputers, parallel systems, and powerful desktop workstations are expected to flood both the storage and transfer capacity of current technologies. It is anticipated that future needs will require terabytes (trillions of bytes) of storage and transfer rates on the order of a gigabyte per second. The NSL hopes to encourage and help develop technologies that will complement the NII.

To meet these needs, the NSL has both technical and commercial objectives. The primary technical objectives are to test and evaluate general-purpose, high-performance, distributed-storage computer architectures, and to develop and demonstrate new and better storage systems to meet the challenges of high-performance computing. On the commercial side, the NSL is to test, evaluate, and integrate specific hardware and software products from multiple vendors, in order to facilitate their commercial availability. An additional objective of the lab is to evaluate and influence emerging national standards for storage systems.

If you want more information about the NIIT, call (800) 299-9733. On the NSL, contact Dick Watson of Lawrence Livermore Lab at dwatson@llnl.gov.

— E.F.

Testbeds — experimental projects to explore and help develop high-speed network technologies for research and ultimately for broader use. All the testbeds described appeared to have used ATM (Asynchronous Transfer Mode) technology, and several exhibitors demonstrated their ATM offerings.

Multiprocessor Distributed-Memory Systems
The area of cluster computing continues to be an interesting challenge and opportunity to those with computationally intense problems. There were many meetings, informal discussions and tutorials on the use of this apparently cost-effective approach to high-performance computing. Not only can one assemble a clustered system at a relatively low cost (see “High-Performance Computing and Communication”), but under the right conditions a user can run an application using processing cycles from other systems on the network that are idle most of the time. Desktop computers are getting more and more powerful, and are usually connected to a LAN (local area network). Collectively, potential megaflops if not gigaflops of power are available on colleagues’ machines all over a university. The software to handle the task of transparently running a job on idle nodes already exists, and is in use at the University of Wisconsin, and Florida State University, and other sites.

The principal designers of PVM and the developers of DQS (Distributed Queuing System, at Florida State University) are developing new interfaces to facilitate access to these available processing re-

(continued on page 30)
Scientific visualization is an extraordinarily active field these days. I recently attended Visualization '93, the fourth such annual international conference, part of a week that also included several workshops and tutorials, as well as symposia on Parallel Rendering and Research Frontiers in Virtual Reality that highlighted major issues in the field. The conference was sponsored by the Technical Committee on Computer Graphics of the IEEE (Institute of Electrical and Electronic Engineers), in cooperation with the Special Interest Group on Graphics of the Association for Computing Machinery (ACM SIGGRAPH). The variety of the week's fascinating lectures reflected the breadth of an interdisciplinary field that brings computer scientists together with people in such diverse areas as physics, medicine, archaeology, environmental science, astronomy, and perceptual psychology.

Several scientists at the conference emphasized a basic distinction between scientific visualization and computer graphics: computer graphics strives to simulate the world in a realistic or hyper-realistic way, whereas scientific visualization often has to deal with abstract data — often in very large sets. These data are not necessarily visual but are made comprehensible by visualization; the most realistic-looking images are not necessarily the most informative. Thus, the goals and problems of scientific visualization are very different from those of computer graphics.

The conference is still a small one (about four hundred people), which made it very comfortable to speak with other visualization scientists and with the people who demonstrated the various graphics programs — often the people who wrote the applications. The growing number of scientists specializing in this field has warranted establishing a distinct discipline and a conference at which to publish. The week's presentations included speeches, scientific research papers presenting new methods, panels, case studies of specific applications, evening meetings on various related topics, and demonstrations of software packages.

The Visir Tomb in Egypt was reconstructed graphically from fragments at the site, combining the techniques of computer science (pattern-matching, image-processing) with archaeological expertise. The work was done by Patrizia Palmidese and associates at CNUCE and the University of Pisa.

Scientific Visualization: Highlights and Visions from a Field in Ferment

Estarose Wolfson
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Several issues appeared repeatedly in the papers:
- Graphics programs have to be interactive to be useful as a research tool.
- Parallel systems are necessary to handle the large amounts of data.
- Senses other than vision must be employed for better comprehension and broader possibilities; virtual reality can also be used when available.
- The psychology of visual perception must be taken into account.
- Scientific truthfulness must be maintained and safeguarded.

**A Vision for Visualization**
These issues were brought out in the keynote speech by Frederick P. Brooks, Jr., of the University of North Carolina, “A Vision for Visualization.” He maintains that one very important use of visualization is as an experience, and that this experience is obtained through highly interactive computer programs. They do not need the highest quality graphics, but must have quick feedback to allow the user to test out ideas and develop new theories. To enhance the experience one must involve the different senses, create an immersive environment, and for abstract data create new possibilities of representation. For example, with sonification one can use sound to represent a variable such as physical vibration, and using the haptic sense, one can feel when two molecules dock together. He stressed the idea of immersive graphics instead of through-the-window graphics. With the use of virtual-reality headsets that provide visual and aural cues, one intuitively changes viewpoint to observe objects, rather than rotating the objects — in the virtual world, one can look around a medical patient instead of rotating the patient. As a field, though, virtual reality is still so new that the hardware and software are not yet easy to use.

In regard to imaging, it is becoming clear that stereoptic images are preferable to flat renderings of perspective views, since a stereo image maintains the parallel lines and planes of the objects represented, and thus retains the messages inherent in the data.

Brooks pointed out that multiple images (of global and local views) are needed to keep the observer from getting lost, when rotating and moving through an environment of objects. Charts can be added to convey more information.

**Visualization and Scientific Truth**
Brooks also discussed the obligation of truthfulness in scientific presentations. We are all influenced by show business, by fantasy; scientists must guard against those influences. They must be sure that the message they are conveying is true to the science that they are displaying, and should therefore carefully label any divergences on the images or animations.

As an example of this misinformation, Brooks cited a popular scientific film that shows a fly-by of the surface of Mars. One sees a beautiful planet with steep mountains and deep valleys, whereas the real surface is less dramatic. For the scientists’ information, the vertical dimension had been enhanced — an enhancement never mentioned in the film. Music can also create wrong impressions, since it carries with its own messages and clues. Thus it must be carefully chosen not to interfere with the visualization.

Numerous other examples of wrong impressions were discussed in an evening session called “How to Lie and Confuse with Visualization.”
Sessions of Interest
During most of the conference, there were three simultaneous sessions. Here are some other highlights of general interest from the ones that I attended:

Margaret Geller of Harvard’s Astronomy Department talked about her work on mapping the universe, and her discovery of the largest known structures. She found that galaxies are not randomly scattered throughout the universe, but form narrow bands encircling large empty areas of space. It was through the visualization of the massive amounts of data that she discovered this patterned placement of the galaxies; the techniques of visualization thus made a substantial contribution to her scientific research.

She also made the award-winning film, Where the Galaxies Are from these visualizations.

With a stunning display of stereo images, Mark Ellison of the Department of Microscopy and Tomography at the University of California at San Diego talked about his work in tomographic reconstruction. He showed 3-D images of dendrites and the spinal column. His group invented new methods to obtain these images, and the visualization led back to the data and new theories. As he displayed his extraordinary images, the audience wore ordinary cardboard 3-D glasses. His software is available on request.

A method for visualizing long DNA sequences was presented. The resulting highly interactive visualization program fills space with the long genomic sequences in a visually comprehensive way and thus presents an important method for finding patterns of nucleotides within the data.

Bernard Geiger of INRIA France, who in conjunction with Jean-Daniel Boissonat (once a post-doctoral fellow in the Robotics Lab at NYU) presented a case study of a 3-D simulation of the delivery of a baby. This simulation is a variation of the classic robotics problem, called the piano-mover’s problem, which examines how to move an object around obstacles in its path. (On a related topic, see my article in the January 1993 issue of this newsletter.) Here, computer reconstructions derived from magnetic resonance images (MRI) of a (nonpregnant) woman’s pelvis and an artificially created baby’s head were used as obstacle and object. Methods of computational geometry were used to find if rotating the head would allow the baby to pass through the pelvis, or if a cesarean was needed.

Bill Lorensen of General Electric talked about his work, which uses video mixing during a medical operation to superimpose live video images of a patient’s head and MRI-derived images of the tumor in her brain. These medical simulations are still in the experimental stage.

Beyond 3-D
Two papers confronted visualizations of multi-dimensional data. One explained a method in which a matrix of orthogonal two-dimensional slices of the data were displayed. An action in one window caused changes in the others. The other paper explained a method of creating the illusion of the fourth dimension by thickening two- and three-dimensional manifolds with circles at each point and applying texture mapping, 4-D lighting, and different levels of transparency. This interactive program gives an intuitive feeling of the fourth dimension.

There were a number of sessions on flow visualization. An example showed the effect of an airplane propeller on airflow by using streamlines of different colors for each cycle of the blades. Tracing pollutants spreading over an area of California was presented here, another volume — a large deposit of salt under the earth’s surface — is reduced to a feature-based model suitable for use by numerical simulators. Top, the seismic data are analyzed to reveal two separate salt bodies. Center, one of the bodies is enclosed in a deformable sphere made up of 1600 triangles. Its triangular mesh is then deformed to “shrink-wrap” the object. This surface mesh then used to generate a tetrahedral volume mesh (bottom), which is used as a computer model of the salt deposit. The method was devised by George Celniker, Indranil Chakravarty, and Jan Moorman and colleagues at the Schlumberger Laboratory for Computer Science at Austin, Texas.
Filters can be applied to digital images to alter them in some way. Each pixel is modified, using information about itself and its neighbors. Shown above are magnifications using the old standard filter (center) and the optimal filter (right) devised by Ingrid Carlbom of Digital Equipment Corporation.

with multiple windows representing global and local views of the environment and the fluid flows.

A paper by Nelson Max of Lawrence Livermore National Laboratory presented an interactive system that animated flow volumes (a volumetric equivalent of streamlines that conveys more information) generated by dye or smoke flowing past a polygonal model. First the opaque polygonal objects are placed in the image, then translucent smoke is added. The software and hardware make for a highly interactive system: one can apply different parameters (compressible flow, smoke puffs, local or global effects) and view either turbulence, spiraling, or splitting as the flow moves over the solid objects.

One system used the analogy of cans of paint to spray smart particles at a set of data in order to render and visualize it. These sprays highlight different aspects of the data by linking a type of visualization to a specific type of data. For each spraycan, a target and a behavior are matched. Surface-seeking sprays go forward until they hit a surface. Volume-penetrating ones bombard the data set. Flow-tracking ones are influenced and carried around by surrounding forces. Different sprays can be mixed and built upon. Thus, within one image, different abstract visualizations can be combined by using a number of sprays.

A paper on dichromatic displays showed that some objects can be rendered accurately even on systems that are limited to two colors (for example, with laser light, blue is a problem). Since the colors obtained from a single light source shining onto an object usually map onto a diagonal 2-D slice through the 3-D color cube, a dichromatic color representation using only two primaries instead of three can be sufficient.

Perceptual psychology plays an important role in our interpretation of what we see. Colors that are juxtaposed look different than they do if they are presented individually, and they create different illusions. This becomes a problem in scientific visualization, since different color scales bring out different information — or, worse yet, hide information. Interactive programs are designed to allow the user to choose between 2-D and 3-D representations and to alter the color maps.

Bernice E. Rogowitz of IBM took another approach: she spoke about a system that links high-level descriptors of each type of application with appropriate visualization techniques, and thus constructs rules that restrict the visualization to these pairings. The goal is for the users to work more efficiently with their data by using this rule-based visualization.

Parallel Computing and Graphics

Graphics rendering involves massive calculations, and there’s growing interest in using parallel computations and systems for it. Several ideas and objectives surfaced at the conference.

There is a need for high-performance computer architecture adapted specifically for graphics. For example, frame-buffer parallelism was discussed to complement processor parallelism. One idea is to have one frame buffer for each machine in the parallel system. A partial image would first be created with each machine’s frame buffer from the local data, and then all these partial images would be composited into a final image. This would bring another level of parallelism into the rendering stage.

Another issue discussed was data decomposition — how to break up a problem to make the most efficient use of parallel computations:

• Which should be decomposed, the object or the image data?
• With dynamic subdivision, at various times during the program, data can be redistributed from busy machines to idle ones.
• Different types of subdivision may be needed, since graphical data are not uniformly distributed in space.

Algorithms that use data compression, such as MPEG or JPEG, are important. A goal is to have (continued on page 30)
Multimedia Software and Peripherals

Now at the NYU Computer Store

Arthur Johnson
johnsnaj@acfcluster.nyu.edu

Much has been written lately about the many important advances in the power of microcomputers. Meanwhile, a lot has also been happening in software development both on the Macintosh and PC platforms.

Most of today’s popular software will still be used in the same fashion as it has been. However, with more computing power coming to many of our desktops, there will also be some important changes in the use of software. Many users may want to upgrade and modify their existing systems to take advantage of new and exciting multimedia software.

Multimedia Software and Hardware

One indication of the quickly changing software market is the rapid propagation of CD-ROM software for both Macintoshes and IBM-compatible PCs.

As the spring semester begins, the NYU Computer Store will have more than 150 CD-ROM titles for both Macs and PCs — most in stock, but some by special order. Some of the more popular titles are:

- Multimedia Beethoven
- Microsoft Bookshelf for Windows
- Microsoft Dinosaurs for Windows
- Microsoft Movie Matinee for Windows & Mac
- Monarch Notes for Mac & PC
- USA Street Atlas
- Dracula Unleashed
- Dragon’s Lair
- Space Shuttle for Windows & Mac
- Home Medical Adventures for Windows

The NYU Computer Store also carries the necessary peripherals to play back CD-ROM software, including CD-ROM readers and PC sound cards. Two of the more popular sound cards are Creative Labs’ 8-bit stereo Windows-compatible Sound Blaster Pro and Media Vision’s 16-bit stereo Pro Audio Spectrum, compatible with both Windows and OS/2. The Computer Store supports Apple’s CD 300 & 150 CD-ROM readers and NEC’s CDR series. If you have any suggestions or inquiries about other multimedia products, please call us at 998-4591.

New Pricing and Site Licenses

Other new software developments at the Computer Store include changes in both Microsoft pricing and product availability and Macromedia’s future site licensing plan for NYU.

As of January 1, 1994, our arrangement with Microsoft allows us to sell its software at an academic discount to any US college student. New products that are being released from Microsoft as of the new year are: Word 6.0 for the Macintosh and Excel 5.0 for both Windows and Macintosh. News is also hitting the press about Windows 4.0, which should become available to the public sometime in the second quarter of 1994. This new implementation of Windows appears to be a powerful graphical user interface (GUI) that will finally allow users to view directories as folder objects on the desktop.

Also, new this year, the NYU Computer Store is administering a site license with Macromedia for such programs as Director, Authorware Professional, and 3D products. The site license makes their products (continued on page 30)

Arthur Johnson is the Assistant Manager of the NYU Computer Store.
Computer Metamorphoses: Image Manipulation as a Creative Tool

Ovid would have loved Morph and Video Fusion — he might have done his *Metamorphoses* in video, not verse. These computer programs allow the user to create digital metamorphoses — or *morphs* — such as those in the film *Terminator 2* and the ones on these pages.

Morphing is just one of the tools of image manipulation used by the students in Peter Bardazzi's Introduction to Multimedia and Computer Graphics, a course offered in the animation area of the Department of Undergraduate Film and Television at NYU's Tisch School of the Arts. Working on the Macintosh-based multimedia stations in the Academic Computing Facility's Arts and Media Studio, they can scan, color, distort, and print images, record and manipulate sounds and video clips, and use the many components in a videotape or a QuickTime movie. (For a list of the software at the lab, see the box opposite.)

The students' assignment was to create a short QuickTime movie, using still and video images and sound from several sources, editing and manipulating the materials in a variety of programs such as Video Fusion, Fractal Design's Painter, and Adobe PhotoShop, and integrating them into a creative whole. A major objective was for the students to learn to deal flexibly with all the media, rather than treating them as discrete entities, so that they can incorporate the skills they learn in this course into their production courses.

— David Frederickson with Peter Bardazzi
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bardazzi@acfcluster.nyu.edu

In the subtly colored morphing sequence of her QuickTime movie, Jenny Kubo changed one friend's face into another's (left); at right, Ted Minoff morphs a self-portrait into a surreal skull, distorted in Fractal Design Painter.
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 and color printers. (For the latest information about equipment, hours, and access policies, please call the ACF Help Line, 998-3333.) Similar hardware and software are available for use by faculty in the Innovation Center in Warren Weaver Hall; call 998-3044 for further information.

<table>
<thead>
<tr>
<th>Still Images</th>
<th>Sound and Music</th>
<th>Interaction</th>
<th>Interactive Tutorials</th>
<th>Utilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe Photoshop 2.5</td>
<td>Code Finale 2.6.3</td>
<td>Aldus Persuasion 2.1</td>
<td>The Book of MIDI</td>
<td>Retrospect 1.3c</td>
</tr>
<tr>
<td>Adobe Illustrator 3.2</td>
<td>OSC Deck 1.04</td>
<td>HyperCard 2.1</td>
<td>Macintosh Basics</td>
<td></td>
</tr>
<tr>
<td>Aldus Gallery Effects 1&amp;2 1.5</td>
<td>DigiDesign Sound Designer II</td>
<td>MacroMind Director 3.1</td>
<td>Macintosh Electronic Reference</td>
<td></td>
</tr>
<tr>
<td>Claris MacDraw Pro 1.0v1</td>
<td>OpCode Cue 3.0.5</td>
<td>OpCode MIDIplay</td>
<td></td>
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</tr>
<tr>
<td>Claris MacPaint 2.0</td>
<td>OpCode Galaxy Plus 1.2.1ml</td>
<td>Voyager Videostack Toolkit 2.2</td>
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</tr>
<tr>
<td>Fractal Design's Painter X2 2.0</td>
<td>OpCode Max 2.5.2</td>
<td>Voyager CD-Audio Toolkit 1.2</td>
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<tr>
<td>Quark XPress 3.2</td>
<td>OpCode Studio Vision 1.4</td>
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<td>Kai's Power Tools 1.0</td>
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<td>Andromeda Series 1</td>
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<td>Ofoto 2.0.1</td>
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<td>EFI Color Cachet 1.0.2</td>
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<tr>
<td>Xaos Paint Alchemy</td>
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</tbody>
</table>

| Moving Images                 |                              |                   |                       |            |
| Adobe Premiere 3.0            |                              |                   |                       |            |
| Apple QuickTime 1.6           |                              |                   |                       |            |
| Macromedia                   |                              |                   |                       |            |
| Macromedia Model 1.0.0        |                              |                   |                       |            |
| Macromedia Life Forms 1.0.1  |                              |                   |                       |            |
| MacRenderMan 1.1.1            |                              |                   |                       |            |
| MacroMind 3D 1.1              |                              |                   |                       |            |
| MacroMind Director 3.1        |                              |                   |                       |            |
| MacroMind MediaMaker 1.2      |                              |                   |                       |            |
| QuickPICS 1.0                 |                              |                   |                       |            |
| Raster Ops MoviePak          |                              |                   |                       |            |
| Video Fusion 1.5              |                              |                   |                       |            |
Meetings of Interest

International Workshop on Modeling, Analysis and Simulation of Computer & Telecommunications Systems: January 31-February 2, 1994, Durham, N.C. Sponsors: IEEE, and Duke University. For information, contact Erol Gelenbe at (919) 660-5442 or via e-mail at erol@egr.duke.edu.

SAC '94: 8th Annual Symposium on Applied Computing: March 6-8, 1994, Phoenix, Ariz. Sponsors: SIGAPP, SIGBIO, SIGAPL, SIGCUE, SIGFORTH, and SIGSMALL. For information, contact Hal Berghel at (501) 575-7343 or via e-mail at hlb@uafhp.uark.edu.

CSC '94: 22nd Annual ACM Computer Science Conference: March 8-10, 1994, Phoenix, Ariz. Sponsor: ACM. For information, contact Don Nowak at (212) 626-0512 or send e-mail to csc94@acmvm.bitnet.


Learn to Search Online Databases in the DIALOG Classmate Program
The DIALOG Classmate program allows NYU students and faculty to search more than one hundred different databases covering a variety of academic disciplines. Search from the library or your home or office computer. Program participants are trained in electronic search techniques by Bobst Library online search specialists and receive one hour additional free search time.

All DIALOG Classmate program participants must attend a basic hands-on workshop, which covers online search strategies, specific commands, system features and downloading procedures. The DIALOG Classmate workshops are open to currently enrolled NYU students and faculty, on a walk-in basis. For additional information, contact Lise Dyckman at dyckman@acfcluster.nyu.edu or 998-2513.

To attend a training session, simply bring your current NYU ID, a DOS-formatted floppy disk (either size), and your research questions to the Electronic Resources Center, Level B, Bobst Library, on any of these dates:

- Feb. 2 6 to 8pm
- Feb. 18 10am to noon
- Feb. 28 10am to noon
- March 10 6 to 8pm
- March 22 10am to noon
- March 30 6 to 8pm

Supercomputing '93 (continued from page 22) sources. It is obvious this approach can benefit many users. Researchers with computationally intensive problems often encounter stages when their work requires massive amounts of computer time, far exceeding the capabilities of their own machines. Transparent access to idle machines on the network can provide the needed cycles. Presumably the demands of the various researchers should average out. Thus, all of the machines on a network could be thought of as a potential virtual multiprocessor machine providing megaflops of computational power.

Multimedia Software (continued from page 27)
available at 50 to 70 percent off list price. This benefits both Windows and Mac users who are pursuing developing multimedia programs of their own and want to use Macromedia tools. For further information on terms and prices for site licenses, please call us or stop in to the Computer Store.

Scientific Visualization (continued from page 26)
simple parallel rendering systems that are simple and modular, which combine both volumetric (voxel) and geometric (polygonal) primitives. In the next ten years, the aim is for parallel rendering systems to be capable of handling very large and multidimensional data sets, and doing texture mapping, ray-tracing, radiosity, global illumination, and shadowing.

Much of the software is available for the asking. For more information, please contact the author.
Index to the Schedule of ACF Instructional Sessions

ARC/INFO, ARC/VIEW 36
ABC's of Computers 33 – 34
Choosing Your Computer 33
Computers and Operating Systems 34 – 35
CWIS — An Introduction to the Campus-Wide Information System 36
E-Mail — ACF E-Mail and Information Services (EMIS) Account 35
E-Mail — the DEC Mailer, FAXmail, and Other Advanced Topics 35
E-Mail — Eudora 35
E-Mail — FAXmail 35
E-Mail — NUPOP 35
Eudora 35
Excel — Introduction 39
FAXmail 35
Geographic Information Systems 36
Getting Started on Your New Computer 33
Graphics and Multimedia 36
High-performance Supercomputer Resources 37
HyperCard 36
Kermit 37
Lotus 1-2-3 — Introduction 39
Mac — Painting and Drawing 36
Mac — Troubleshooting and Maintaining 34
Mac — Using a Macintosh at an ACF Lab 33
Mathematica 38
Microsoft Word 39
Network Services Available at NYU 36 – 37
NUPOP 35
Painting and Drawing on a Macintosh 36
PC — Troubleshooting and Maintaining 34
PC — Using a PC at an ACF Lab 33
RISC Farms 37
SAS — Introduction 39
Scientific Computing and Visualization 37 – 38
Scientific Visualization at the ACF 38
SPSS — Data Entry for SPSS and other Statistical Packages 39
SPSS — SPSS for Windows 38
Statistics, Spreadsheets, and Databases 38 – 39
Supercomputer Resources 37
UNIX — Using UNIX at the ACF 33
Uploading and Downloading Using Kermit 37
Using the ACFcluster 33
Visualization 37
VM/CMS 34
VMS — For Instructors Using VMS at NYU 34
VMS — Topics in VMS (Files and Commands) 34
WordPerfect 39
WordPerfect Graphics 36
Wordprocessing 39
WYLBUR — Using WYLBUR at the ACF 34
WYLBUR — An Overview 35

At the ACF HelpLine
HelpLine is a computer user's support service provided by the Academic Computing Facility to members of the NYU community. It provides a single telephone point of contact for clients of ACF services. Callers are welcome to inquire on any topic relevant to academic computing at NYU, and in particular to the services of the Academic Computing Facility. The HelpLine's business hours are 9:00 am to 6:00 pm Monday through Friday.

Calls to the HelpLine outside of business hours will be answered by an automated information service, providing pertinent information on various ACF services. This feature provides menu-driven information about events and classes sponsored by the ACF, hours of ACF computer labs, software distributed by the ACF, and information on dialing in to NYU-NET. If the automated service does not answer your question, you can leave a message with voice mail, a feature of NYU's telephone system, and an ACF staff member will call back during the next business day.

You can also get help by sending E-mail to comment@nyu.edu. ACF staff members monitor messages to comment continually, and a reply is typically sent within 24 hours. Holders of EMIS accounts can also reach comment by selecting Option 7 on the main menu and following the on-screen instructions. Please remember to include your name (and phone number, if you are reporting a problem that would not permit an ACF staff member to reach you by e-mail.)

The HelpLine number is 998-3333. We welcome your calls and comments.
All members of the NYU community are welcome at the ACF’s classes, workshops, and talks. There is no charge for any of the ACF Instructional sessions, but participants should have a current, valid NYU ID. In some cases, as noted just after a course description, a reservation or an appropriate computer account is required.

The courses are grouped in categories that are largely self-explanatory. Those in the first category, “ABC’s of Computers,” are intended for both computer novices and people new to the ACF facilities, and should serve as introductions to the computers and their operating systems, as well as the other parts of the mix—networks, printers, file servers, and so forth—that the user will be dealing with.

The format of each entry, shown below, helps clarify the information:

<table>
<thead>
<tr>
<th>Category</th>
</tr>
</thead>
</table>
| **Title of the Course or Software**  
(Platform—the machine the program runs on) |
| A brief description of the course, the software or machines used, and the main topics covered. Instructor’s name. |
| Requirements, such as account or reservations; whether workshop, class, or talk; special arrangements, etc. |
| Building and room |
| Days and Times |
| Dates |

Classes are introductory, walk-in, hands-on training sessions about an hour long. Reservations are sometimes required; when not, simply arrive a few minutes early at the classroom.

Classes by Arrangement: Faculty members may sometimes arrange special classes for a specific course or research group. These do not necessarily have to be given at an ACF site. For classes in IBM WYLBUR or VM/CMS, call John Lee (998-3406); for statistics, call Frank LoPresti (998-3398); for other applications, call the ACF HelpLine (998-3333).

Workshops are more intensive sessions that run about three hours. They are held in computer classrooms where each participant can work on a computer (occasionally shared by two participants), so reservations are usually required.

Talks cover more advanced topics in greater detail, usually with a demonstration of relevant software and computer screens. They generally run about an hour and a half.

Reservations: To reserve a place, please call the ACF HelpLine at 998-3333 during the week of the workshop or class.

Computer accounts: There are several kinds of ACF accounts, which give the holder access to different types of machines and services. For information on general, individual, and class accounts, see the box on page 44. For electronic mail accounts, see page 5. All are available through the ACF Accounts Office (Warren Weaver Hall, room 305; 998-3035).

Platform: The type of computer a certain type of software runs on.

UNIX: Several types of computers use variants of UNIX—AIX on some IBMs, Ultrix on some DEC computers, IRIS on Silicon Graphics workstations.

DEC/VMS: Digital Equipment Corporation makes several types of computers; its VAX minicomputers use the VMS operating system.

PC: Desktop and portable computers based on the architecture of the original IBM PC—also called clones or DOS machines, 386, 486, etc.

Mac: Apple’s Macintoshes

IBM mainframe: Runs the VM/CMS operating system and WYLBUR, an interface.

Please note:
In order to keep abreast of new software acquisitions and evolving user needs, we may offer additional classes, talks, or workshops during the second half of the semester. For the latest schedule information, consult the NYU CWIS (see page 2 for information on how to access the NYU CWIS), check for an update-flyer at our computer labs, or watch the Academic Computing Facility’s space in NYU Events.
Choosing Your Computer
(Mac and PC)
This talk is intended to help you select the best personal computer for your needs. It will cover the basic components of a computer, as well as the other hardware required for various tasks. We will also discuss how you can assess your particular needs to establish your criteria for selecting computer tools. Taught by staff from the ACF and Kevin Edwards from the NYU Computer Store.
Limited seating; first come, first served; talk.
Main Building, room 509
Fridays 12:00–2:00
Feb. 4, 18
Mar. 4, 25

Getting Started on Your New Computer
(Mac and PC)
This introductory talk will help familiarize you with your new computing equipment. It will focus on such basic operations as setting up your computer; setting up a printer; and configuring your operating system with the fonts and tools you need.
This talk will be particularly helpful to recent or prospective purchasers of computing equipment. Taught by staff from the ACF and Kevin Edwards from the NYU Computer Store.
Limited seating; first come, first served; talk.
1. For Mac Owners
Main Building, room 509
Friday 12:00–2:00
Feb. 11
2. For PC Owners
Main Building, room 509
Friday 12:00–2:00
Feb. 25

Using a Macintosh at an ACF Lab
(Mac)
A hands-on introduction to the Macintosh computer. Topics include working with the graphical user interface, understanding the file system, choosing printers, file servers, and other devices, and launching software applications. ACF staff.
Limited seating; first come, first served; hands-on class.
Education Building, 2nd floor
Tuesdays 11:00–12:00
Thursdays 2:00–3:00
Feb. 1 through Feb. 24
Third Ave. North Res. Hall, level C3
Tuesdays 2:00–3:00
Thursdays 11:00–12:00
Feb. 1 through Feb. 24

Using a PC at an ACF Lab
(PC)
A hands-on introduction to the PC — the "IBM-type" personal computer. Topics include working with the user menus on the PCs in the labs, understanding the file system, choosing printers and file servers, and launching software applications. ACF staff.
Limited seating; first come, first served; hands-on class.
Education Building, 2nd floor
Wednesdays 11:00–12:00
Feb. 2 through Feb. 23
Third Ave. North Res. Hall, level C3
Wednesdays 2:00–3:00
Feb. 2 through Feb. 23
14 Washington Place, basement
Tuesdays 11:00–12:00
Thursdays 2:00–3:00
Feb. 1 through Feb. 23

Using the ACF cluster
(DEC/VMS)
An introductory class on using the VMS operating system on DEC minicomputers that make up the ACF cluster, as accessed at ACF labs through PCs, Macs, and terminals. The basics will be covered: logging onto the cluster, organizing files, editing text, printing files, and using applications. ACF staff.
ACF cluster account required; limited seating; first come, first served; hands-on class.
Third Ave. North Res. Hall, level C3
Wednesdays 11:00–12:00
Feb. 2, 9, 16, 23

Using UNIX at the ACF
(UNIX machines)
An introductory class on using the UNIX operating system, variants of which run on several different classes of computer at the ACF. Most are accessed at ACF labs through PCs, Macs, and terminals, but the SGI workstations also use UNIX. The basics will be covered: logging onto the host machines, organizing files, editing text, printing files, and using applications. ACF staff.
ACF UNIX account required; limited seating; first come, first served; hands-on class.
Third Ave. North Res. Hall, level C3
Thursdays 2:00–3:00
Feb. 3, 10, 17, 24

For More Information:
Call the ACF HelpLine at 998-3333.
Using WYLBUR at the ACF (IBM mainframe)

Introduction to accessing and using WYLBUR, the text editor on the IBM mainframe, from the PCs in the ACF Tisch Hall Lab. ACF staff. WYLBUR account required; limited seating; first come, first served; hands-on class.

Tisch Hall, room LC8
Mondays 5:30–6:30, 6:30–7:30
Jan. 31
Feb. 7, 14, 28

Thursdays 5:30–6:30, 6:30–7:30
Feb. 3, 10, 17, 24

Computers and Operating Systems

For Instructors Using VMS at NYU (DEC/VMS)

An introduction to the special features of accounts provided to instructors and classes using the ACF’s VAX/VMS computers.

Under the ACF Course System, teachers of classes with VMS accounts have both “library” and “teacher” directories. Other features include class bulletin boards, direct instructor access to students’ computer work, and (at the request of the instructor) electronic submission of students’ completed homework. Shared electronic workspaces can also be set up, either for the entire class or for subgroups of the class. Stephen Tihor.

Upon request, by appointment; please call the ACF Help Line for more information.

Topics in VMS—Files and Commands (DEC/VMS)

This intermediate-level talk will be of interest to users of the VAX/VMS systems at NYU. Stephen Tihor. Topics will include file names, file types, version numbers, purging, ARCHIVE, RECOVER, remote file access, directory trees, class accounts, scratch disks, loan disk, structure of the cluster, and shared devices.

Attendees are expected to have taken an ACF introductory class in VMS; see listing under ABC’s. Limited seating; first come, first served; talk.

Warren Weaver Hall, room 313
Wednesday 2:30–4:00
Mar. 16

Troubleshooting and Maintaining Your Macintosh (Mac)

Discussion will include troubleshooting techniques and other strategies for dealing with problems that you might encounter while using your Macintosh. Staff from the ACF and Kevin Edwards of the NYU Computer Store.

Limited seating; first come, first served; talk.

Warren Weaver Hall, room 313
Wednesday 12:00–1:30
Mar. 23

Troubleshooting and Maintaining Your PC (PC)

Discussion will include troubleshooting techniques and other strategies for dealing with problems you might encounter while using your PC. Staff from the ACF and Kevin Edwards of the NYU Computer Store.

Limited seating; first come, first served; talk.

Warren Weaver Hall, room 313
Wednesday 12:00–1:30
Feb. 23

VM/CMS (IBM mainframe)

VM/CMS is the operating system of the IBM mainframe. Various available software will be discussed and demonstrated, and mail, file transfer, and Xedit editing functions will be covered. John Lee.

Upon request, by appointment; call John Lee at 998-3406; requires IBM account.

Please note:
In order to keep abreast of new software acquisitions and evolving user needs, we may offer additional classes, talks, or workshops during the second half of the semester. For the latest schedule information, consult the NYU CWIS (see page 2 for information on how to access the NYU CWIS), check for an update-flyer at our computer labs, or watch the Academic Computing Facility’s space in NYU Events.
**Electronic Mail and FAXmail**

**Electronic Mail: Using the ACF E-Mail & Information Services Account (DEC/VMS)**

This series — a talk and a hands-on class — deals with the ACF EMIS (Electronic Mail and Information Services) Account.

1. **Introduction**
   This talk-demonstration will introduce new and prospective holders of an EMIS account to its menu interface and components. Initialization of the account, and elementary electronic-mail concepts and commands will be explained and demonstrated. The EMIS account runs on a cluster of DEC/VMS minicomputers and is connected to NYU-NET. Vincent Doogan.
   *Limited seating; first come, first served; talk.*
   Warren Weaver Hall, room 313
   **Wednesdays 12:00-1:30**
   Feb. 2, 16
   Mar. 2, 16, 30

2. **Troubleshooting Your EMIS Account**
   This session provides practical help to holders of ACF E-Mail & Information Services accounts and general users of the DECmail utility. At a hands-on question-and-answer session, account holders will be able to resolve difficulties in determining the characteristics of their accounts, navigating the EMIS menu structure, and using common electronic-mail commands. Lisa Barnett.
   *E-mail (EMIS) account required; limited seating; first come, first served; hands-on class.*
   Education Building, 2nd floor
   **Thursdays 12:00-1:00**
   Feb. 10, 24
   Mar. 10, 24

**Eudora**
(Mac)
An introductory class for new users of Eudora, an interface for handling electronic mail on Macintoshes connected to NYU-NET.
*For further information, please call the ACF HelpLine at 998-3333.*

**NUPop**
(PC)
An introductory class for new users of NUPop, an interface for handling electronic mail on PCs connected to NYU-NET.
*For further information, please call the ACF HelpLine at 998-3333.*

**Using The DEC Mailer at NYU: FAXmail and Other Advanced Topics (DEC/VMS)**
Advanced selection commands, message extraction, sending faxes via E-mail, and other advanced topics. The DEC mailer runs on the ACF cluster of VMS computers. It is the mail program used by holders of ACF E-mail and Information Services Accounts (see introductory EMIS talks above). ACF staff.
   *Limited seating; first come, first served; talk.*
   Warren Weaver Hall, room 313
   **Wednesday 2:00-3:30**
   Mar. 30

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**For More Information:**
Call the ACF HelpLine at 998-3333.
**Geographic Information Systems**

**ARC/INFO and ArcView (UNIX)**
ARC/INFO is a powerful GIS (geographic information system) from ESRI, which allows all sorts of data to be associated with and keyed to maps. ARC/INFO is used to maintain and to prepare the data. ArcView is the quick-and-easy module from ESRI for viewing, manipulating, printing and querying data from ARC/INFO.

1. **Introduction to ArcView and the Westchester ARC/INFO maps**
In addition to an introduction to ArcView, this talk will introduce the repository of some thirty County of Westchester Department of Planning maps. This current active collection of maps include zoning, hydrology, waste sites and geology and has been made available to the NYU community by the Westchester Planning Department. Tami Strauss (staff assistant cartographer, Westchester Planning Department).

*Limited seating; first come, first served; talk.*

Warren Weaver Hall, room 313
Tuesday 2:00 - 4:00
Mar. 29

2. **Introduction to ARC/INFO**
This talk will include an introduction to ARC/INFO. Frank LoPresti.

*Limited seating; first come, first served; talk.*

Warren Weaver Hall, room 313
Tuesday 2:00 - 4:00
Apr. 5

**Graphics and Multimedia**

**HyperCard (Mac)**
HyperCard is a software package for organizing and presenting information as text, graphics, sound, and animation. ACF staff.

*Reservations required (998-3333); hands-on class.*

1. **Introduction to HyperCard**
Education Building, 2nd floor
Friday 2:00-4:00
Mar. 4

2. **Intermediate HyperCard**
Education Building, 2nd floor
Friday 2:00-4:00
Mar. 18

**Painting and Drawing on a Macintosh Computer (Mac)**
An introduction to painting and drawing on the Macintosh computer, using SuperPaint 3.0. Howard Fink.

*Reservations required (998-3333); hands-on class.*

Education Building, 2nd floor
Friday 2:00-4:00
Mar. 25

**WordPerfect Graphics (PC)**
Using the graphics capabilities of WordPerfect to enrich your documents. Julia O'Brien.

*Reservations required (998-3333); hands-on class.*

Education Building, 2nd floor
Friday 1:00-4:00
Apr. 8, 22

**Network Services**

**An Introduction to the Campus-Wide Information System (NYU CWIS)**
The NYU CWIS, developed by the ACF, is a growing system for disseminating and retrieving information in electronic form. This talk will focus on what is contained in the NYU CWIS and how it is organized. Other topics will include a discussion of the underlying Gopher software and a demonstration of tools for searching Gopherspace. David Ackerman.

*Limited seating; first come, first served; talk.*

Warren Weaver Hall, room 313
Wednesdays 2:30-4:00
Feb. 9, 23
Mar. 9

1. **Internet Services**
This session will include a discussion of several procedures by which individuals using computers at NYU can connect to other computers and services on the Internet, an international network connecting over 1.3 million computers in the United States and abroad. Topics will include file trans-
fers and issues in connectivity. Tim O'Connor.

Limited seating; first come, first served; talk.
Warren Weaver Hall, room 313
Wednesday 2:00–3:30
Feb. 16

2. Library Information via Internet
Many universities have made their online library catalogs available on the Internet. RLIN, a union catalog of many libraries, is also available on the Internet. This session will cover how to access and use these resources. Topics will include how to connect from on- and off-campus, what types of information are available, and identifying resources for locating materials at other libraries. Jeffrey Bary and Lise Dyckman (of Bobst Library).

Limited seating; first come, first served; talk.
Warren Weaver Hall, room 313
Wednesday 2:00–3:30
Mar. 2

3. Communicating: Kermit, Telnet, and FTP
A variety of machines and networks are connected to NYU-NET, NYU’s campus-wide network, and users can communicate with them via an assortment of communications protocols and packages.

In this session, four communications software packages that are commonly used at NYU will be examined, to clarify which should be used in each sort of connection possible when communicating via NYU-NET. Such issues as file transfer and terminal emulation will also be addressed. Larry Mingione.

Limited seating; first come, first served; talk.
Warren Weaver Hall, room 313
Wednesday 2:00–3:30
Apr. 6

4. BITNET and Its Services
BITNET is an international network of over 2000 large computers at universities and research centers. In this talk, many of the features of the BITNET will be demonstrated. Topics will include BITNET “file servers” and “list servers,” file transfers, connectivity and electronic mail, relays, electronic magazines, and online “White Pages.” Tim O’Connor.

Limited seating; first come, first served; talk.
Warren Weaver Hall, room 313
Wednesday 2:00–3:30
Apr. 20

Uploading & Downloading Using Kermit
A useful class for those who want to do their wordprocessing and other work on their desktop PCs or Macs, and then send the files by E-mail or upload them to VMS or UNIX machines, or need to download files from distant machines to their own computers. Kermit is a terminal-emulation file-transfer application distributed free-of-charge by the ACF. Tim O’Connor.

Limited seating; first come, first served; talk.
Warren Weaver Hall, room 313
Thursday 12:00–1:00
Mar. 24
Apr. 14

1. For PC Users
Warren Weaver Hall, room 313
Thursday 12:00–1:00
Mar. 10
Mar. 31

2. For Macintosh Users
Warren Weaver Hall, room 313
Thursday 12:00–1:00
Mar. 10
Mar. 31

High-performance Supercomputer Resources (IBM RISC farm;
NSF supercomputers)
An introduction to high-performance resources available to NYU faculty and students, both local resources and those accessible via the Internet.

Local resources include a cluster of high-performance RISC-based RS/6000 workstations that has been acquired as part of the Center for Applied Parallel Computing that the ACF, in collaboration with the IBM Corporation, has up at NYU. The discussion will cover the RISC farm’s uses and software, as well as the availability of additional resources for computationally intense applications.

The speaker will then focus on the use, from NYU, of high-performance systems at the National Science Foundation supercomputing centers. NYU researchers and students have been given access via the Internet to these centers as well as to supercomputing centers operated by NASA and DOE. (A kit available from the ACF in Room 305, Warren Weaver Hall, describes how to apply to some of the NSF centers.) Edward Friedman.

Limited seating; first come, first served; talk.
Warren Weaver Hall, room 313
Wednesday 12:00–1:30
Mar. 9

For More Information:
Call the ACF HelpLine at 998-3333.
Mathematica
(Mac, PC, and UNIX)
Mathematica is a general system for doing many sorts of mathematical computations by computer. It can function as a calculator, programming language, or tool for scientific visualization in two or three dimensions.
Howard Fink.
Limited seating; first come, first served; talk.
Education Building, 2nd floor
Friday 2:00–3:30
Mar. 4

Scientific Visualization Resources at the ACF
(Silicon Graphics, Mac, and PC)
An introduction to the various scientific visualization software systems available on the ACF and other NYU computing systems. They include the NCAR-GKS software system, a popular two-dimensional graphics library featuring color fill, contouring, and maps of the earth; AVS from Advanced Visualization System, Inc.; Khoros, a system from the University of New Mexico; Minneview from the University of Minnesota; and scientific image processing systems from NYU, NIH, and NCSA. This talk will include discussion of the options available for obtaining output from these systems — printed images in color or black-and-white, or moving images on laserdisk or videotape.
Additionally, the speaker will talk about the content, structure and future directions of the most popular two-dimensional graphics software package in the world. The NCAR library is based on two ISO standards, GKS and CGM, and is operational on platforms from shared systems to supercomputers. It contains utilities for a range of graphic applications, from drawing simple X-Y plots to creating complex color images that allow overlaying and masking. Demonstration will include examples of the capabilities of the package and how it has been used by researchers at NYU. Edward Friedman.
Limited seating; first come, first served; talk.
Warren Weaver Hall, room 313
Wednesday 12:00–1:30
Mar. 9

SPSS: SPSS for Windows
(PC, VMS, and WYLBUR)
SPSS (Statistical Package for the Social Sciences) is a comprehensive, integrated system for statistical data analysis. While this hands-on presentation will use the new Windows version of SPSS, the programming concepts are applicable to all versions of SPSS.

1. Introduction to SPSS
Data input, transformations of variables, creation of “system files,” and other manipulations of data will be discussed. Frank LoPresti.
Reservations required (998-3333); hands-on class.
14 Washington Place, basement
Tuesday 6:00–7:30
Feb. 1
Friday 10:00–11:30
Feb. 25
Thursday 6:00–7:30
Mar. 24

2. Intermediate SPSS
Elementary statistical procedures for the analysis of data will be covered. Frank LoPresti.
Reservations required (998-3333); hands-on class.
Education Building, 2nd floor
Tuesday 6:00–7:30
Feb. 8
Friday 10:00–11:30
Mar. 4
Thursday 6:00–7:30
Mar. 31

For More Information:
Call the ACF HelpLine at 998-3333.
Data Entry for SPSS and Other Statistical Packages (PC)
A discussion and demonstration of data-entry techniques and related considerations for researchers in the social sciences and other fields. SPSS/DE, Lotus and other software which might be used for data entry will be demonstrated. Verification techniques and outlier searches will be discussed. Frank LoPresti.
Limited seating; first come, first served; talk.
Warren Weaver Hall, room 313
Friday 10:00–11:30
Mar. 11

Introduction to SAS (PC, WYLBUR, CMS, and VMS)
An introduction to the analyses offered by the software package. Discussion will include such topics as program structure, language syntax, data handling, and running programs written with the particular package. Robert Yaffee.
Limited seating; first come, first served; talk.
Warren Weaver Hall, room 313
Friday 10:00–11:30
Feb. 11

Introduction to Lotus 1-2-3 (PC)
Lotus 1-2-3 was the first major PC spreadsheet, and it remains a central performer. Its concepts and many of its commands are applicable to other spreadsheets. Julia O'Brien.
Reservations required (998-3333); hands-on class.
Education Building, 2nd floor
Friday 1:00–4:00
Feb. 11
Mar. 11

Introduction to Excel (Mac)
Microsoft's Excel is a major spreadsheet for the Macintosh. Howard Fink.
Reservations required (998-3333); hands-on class.
Education Building, 2nd floor
Friday 9:00–12:00
Feb. 11
Mar. 11

Microsoft Word (Mac)
Microsoft Word is a major word-processing program on Macintosh computers and is especially strong on typography and formatting. This is a getting-started class. Howard Fink.
Reservations required (998-3333); hands-on class.
Education Building, 2nd floor
Thursdays 10:00–12:00
Mar. 3, 17

WordPerfect (PC)
WordPerfect is the most widely used PC wordprocessing program, with excellent control of such scholarly tools as footnotes, tables, and equations. Julia O'Brien.

1. Introduction to WordPerfect
Reservations required (998-3333); hands-on workshop.
Education Building, 2nd floor
Wednesdays 1:00–4:00
Mar. 2, 16, 30
Thursdays 1:00–4:00
Mar. 3, 17, 31

2. Intermediate WordPerfect
Reservations required (998-3333); hands-on workshop.
Education Building, 2nd floor
Wednesdays 1:00–4:00
Mar. 9, 23
Apr. 6
Thursdays 1:00–4:00
Mar. 10, 24
Apr. 7

_wordPerfect Graphics (see under Graphics and Multimedia)_

(word processing)

Please note:
In order to keep abreast of new software acquisitions and evolving user needs, we may offer additional classes, talks, or workshops during the second half of the semester. For the latest schedule information, consult the NYU CWIS (see page 2 for information on how to access the NYU CWIS), check for an update-flyer at our computer labs, or watch the Academic Computing Facility's space in NYU Events.

Academic Computing and Networking at NYU January 1994 39
### 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 page 44.

#### January

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Jan. 15 - 16</td>
<td>Instructors apply for Spring 1994 computer Class Accounts as early as possible.</td>
</tr>
<tr>
<td>Jan. 17</td>
<td>Martin Luther King, Jr. Day weekend, all labs closed</td>
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<tr>
<td>Jan. 19 - Feb. 8</td>
<td>Students with Class Accounts register for computer use for Spring semester.</td>
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<tr>
<td>Jan. 19</td>
<td>(Wed.) Spring Semester begins, regular hours</td>
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#### February

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<th>Date</th>
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<tbody>
<tr>
<td>Feb. 19 - 20</td>
<td>Presidents' Day weekend, holiday hours†</td>
</tr>
<tr>
<td>Feb. 21</td>
<td>(Mon.) Presidents' Day*, all labs closed</td>
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#### March

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<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>March 14-19</td>
<td>Spring Recess, regular hours</td>
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#### April

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<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>April 18, onward</td>
<td>(Mon.) Instructors apply for Class Accounts for both summer sessions.</td>
</tr>
<tr>
<td>April 18, onward</td>
<td>(Mon.) Instructors may begin to apply for fall semester computer Class Accounts.</td>
</tr>
<tr>
<td>April 24</td>
<td>(Sun.) Founders Day, regular hours</td>
</tr>
<tr>
<td>April 27-May 11</td>
<td>Students who expect Incompletes in spring semester courses should apply for computer account extensions. (Instructor's signature required.)</td>
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<tr>
<td>April 27-May 11</td>
<td>Students with spring semester Class Accounts should archive all files they wish to save after May 11.</td>
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#### May

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<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Through August 30</td>
<td>Individual Account holders not returning for 1994/95 should archive their files.</td>
</tr>
<tr>
<td>May 4</td>
<td>(Wed.) Individual Account holders should apply for renewal of their accounts before leaving for the summer. (Individual Accounts expire on Aug. 30.)</td>
</tr>
<tr>
<td>May 4-11</td>
<td>Spring semester final examinations, hours to be announced</td>
</tr>
<tr>
<td>May 11</td>
<td>(Wed.) Student Class Accounts issued for the spring semester expire.</td>
</tr>
<tr>
<td>May 12</td>
<td>(Thurs.) Commencement, regular hours</td>
</tr>
<tr>
<td>May 23</td>
<td>(Mon.) ACF's Summer Hours begin, hours to be announced</td>
</tr>
<tr>
<td>May 23</td>
<td>(Mon.) Summer Session I begins.</td>
</tr>
<tr>
<td>Jan. 28-29</td>
<td>Memorial Day weekend, holiday hours†</td>
</tr>
<tr>
<td>May 30*</td>
<td>(Mon.) Memorial Day*, all labs closed</td>
</tr>
<tr>
<td>May 23-June 6</td>
<td>Students with Summer Session I Class Accounts register for computer use.</td>
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*And a reminder for the summer months:*

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>July 5-July 19</td>
<td>Students with Summer Session II Class Accounts register for computer use.</td>
</tr>
</tbody>
</table>

* University holiday
† Please note: confirmed holiday schedules will be posted via our online news and bulletin board facilities, or can be obtained by calling the ACF HelpLine at 998-3333.
### Spring '94 Calendar

#### January 10 – February 20

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Sat./Sun.</th>
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</thead>
<tbody>
<tr>
<td><strong>JANUARY</strong></td>
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<td>10</td>
<td>11</td>
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<td>13</td>
<td>14</td>
<td>15/16 Dr. Martin Luther King, Jr. weekend holiday hours</td>
</tr>
<tr>
<td>17</td>
<td>18</td>
<td>19 Spring Semester begins. Regular Spring hours resume. Students register for computer use starting today.</td>
<td>20</td>
<td>21</td>
<td>22/23</td>
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<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29/30</td>
</tr>
<tr>
<td><strong>FEBRUARY</strong></td>
<td><strong>WYLBUR at the ACF, 5:30, 6:30</strong></td>
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<tr>
<td>31</td>
<td>2</td>
<td>3 Macs at the ACF, 11:00, 2:00 Using the ACFcluster, 11:00 E-Mail Part I, 12:00</td>
<td>4 Choosing a Computer, 12:00</td>
<td>5/6</td>
<td></td>
</tr>
<tr>
<td>7 WYLBUR at the ACF, 5:30, 6:30</td>
<td>8 Macs at the ACF, 11:00, 2:00 PCs at the ACF, 11:00 SPSS for Windows Part II, 6:00</td>
<td>9 PCs at the ACF, 11:00, 2:00 Using the ACFcluster, 11:00 NYU-CWIS Intro, 2:30 Supercomputer Resources, 12:00</td>
<td>10 Macs at the ACF, 11:00, 2:00 PCs at the ACF, 2:00 UNIX at the ACF, 2:00 WYLBUR at the ACF, 5:30, 6:30 E-Mail, Part II, 12:00</td>
<td>11 Getting Started on a New Mac, 12:00 SAS Intro, 10:00 Lotus 1-2-3 Intro, 1:00 Excel Intro, 9:00 WYLBUR Overview, 6:00</td>
<td>12/13</td>
</tr>
<tr>
<td>14 WYLBUR at the ACF, 5:30, 6:30</td>
<td>15 Macs at the ACF, 11:00, 2:00 PCs at the ACF, 11:00</td>
<td>16 PCs at the ACF, 11:00, 2:00 Using the ACFcluster, 11:00 E-Mail Part I, 12:00 Network Services Part I, 2:00</td>
<td>17 Macs at the ACF, 11:00, 2:00 PCs at the ACF, 2:00 UNIX at the ACF, 2:00 WYLBUR at the ACF, 5:30, 6:30</td>
<td>18 Choosing a Computer, 12:00 WYLBUR Overview, 6:00</td>
<td>19/20 Presidents' Day weekend holiday hours</td>
</tr>
</tbody>
</table>

Dr. Martin Luther King, Jr. Day—all labs closed
Winter recess ends
### Spring '94 Calendar

#### February 21 – April 3

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
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<tbody>
<tr>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>26/27</td>
</tr>
<tr>
<td>Presidents' Day—all labs closed</td>
<td><strong>Macs at the ACF, 11:00, 2:00</strong></td>
<td><strong>PCs at the ACF, 11:00, 2:00</strong></td>
<td><strong>Macs at the ACF, 11:00, 2:00</strong></td>
<td><strong>Getting Started on a New PC, 12:00</strong></td>
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<td></td>
<td>28</td>
<td>28</td>
<td>28</td>
<td></td>
<td>5/6</td>
</tr>
<tr>
<td><strong>WYLBUR at the ACF, 5:30, 6:30</strong></td>
<td><strong>E-Mail Part I, 12:00</strong></td>
<td><strong>Microsoft Word, 10:00</strong></td>
<td><strong>E-Mail Part II, 12:00</strong></td>
<td><strong>Choosing a Computer, 12:00</strong></td>
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<td>28</td>
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<td>12/13</td>
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<tr>
<td><strong>MARCH 1</strong></td>
<td><strong>NYU-CWIS Intro, 2:30</strong></td>
<td><strong>NYU-CWIS Intro, 2:30</strong></td>
<td><strong>E-Mail, Part II, 12:00</strong></td>
<td><strong>SPSS Data Entry, 10:00</strong></td>
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<td>9</td>
<td>10</td>
<td>11</td>
<td>19/20</td>
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<tr>
<td></td>
<td><strong>NYU-CWIS Intro, 2:30</strong></td>
<td><strong>Scientific Visualization at NYU, 12:00</strong></td>
<td><strong>E-Mail, Part II, 12:00</strong></td>
<td><strong>SPSS for Windows Part II, 10:00</strong></td>
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<td>14</td>
<td>16</td>
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<td>18</td>
<td>26/27</td>
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<tr>
<td></td>
<td><strong>Spring recess begins</strong></td>
<td><strong>VMS Files and Commands, 2:30</strong></td>
<td><strong>Microsoft Word, 10:00</strong></td>
<td><strong>HyperCard Intro, 1:00</strong></td>
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<td></td>
<td><strong>Troubleshooting the Mac, 12:00</strong></td>
<td><strong>E-Mail, Part II, 12:00</strong></td>
<td><strong>E-Mail, Part II, 12:00</strong></td>
<td><strong>Choosing a Computer, 12:00</strong></td>
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<td>28</td>
<td>28</td>
<td>28</td>
<td>2/3</td>
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<tr>
<td><strong>ARC/VIEW Intro, 2:00</strong></td>
<td><strong>WordPerfect Intro, 1:00</strong></td>
<td><strong>WordPerfect Intro, 1:00</strong></td>
<td><strong>WordPerfect Intro, 1:00</strong></td>
<td><strong>APRIL 1</strong></td>
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<td>28</td>
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<tr>
<td><strong>ARC/VIEW Intro, 2:00</strong></td>
<td><strong>E-Mail Part I, 12:00</strong></td>
<td><strong>SPSS for Windows Part II, 6:00</strong></td>
<td><strong>Uploading and Downloading on the Mac, 12:00</strong></td>
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42 January 1994   Academic Computing and Networking at NYU
<table>
<thead>
<tr>
<th>Monday</th>
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<td>9/10</td>
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<tr>
<td></td>
<td>ARC/INFO Intro, 2:00</td>
<td>Network Services: Part III, 2:00</td>
<td>WordPerfect Intermed, 1:00</td>
<td>WordPerfect Graphics, 1:00</td>
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<td>11</td>
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<td>16/17</td>
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<td></td>
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<td>Uploading and Downloading on the PC, 12:00</td>
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<td>23/24</td>
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<tr>
<td>Instructors may apply for Class Accounts for both summer sessions.</td>
<td></td>
<td>Network Services: Part IV, 2:00</td>
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<td>WordPerfect Graphics, 1:00</td>
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<td>25</td>
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<td>29</td>
<td>MAY</td>
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<td></td>
<td>Students with Spring semester Class Accounts should archive all files they wish to save after May 11 (through May 11).</td>
<td>Students who expect incompletes in spring semester courses should apply for computer account extensions. (through May 11).</td>
<td>Individual Account holders not returning for 94/95 should archive their files that they wish to keep (through Aug. 30).</td>
<td>Individual Account holders should apply for renewal of their accounts before leaving for the summer.</td>
<td>30/1</td>
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<td>6</td>
<td>7/8</td>
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<tr>
<td></td>
<td>Last day of spring term classes</td>
<td>Spring term final exams begin</td>
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<td>11</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14/15</td>
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<tr>
<td></td>
<td></td>
<td>Spring term final exams end. Spring semester ends. Student Class Accounts issued for the spring semester expire.</td>
<td>Commencement</td>
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<td>27</td>
<td>28/29</td>
</tr>
<tr>
<td>First summer session classes begin. ACF's summer hours begin.</td>
<td>Students with SummerSession I Class Accounts register for computer use (through June 6)</td>
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<td></td>
<td>Memorial Day weekend—holiday hours</td>
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<tr>
<td>30</td>
<td>31</td>
<td>JUNE 1</td>
<td>2</td>
<td>3</td>
<td>4/5</td>
</tr>
<tr>
<td>Memorial Day—all labs closed</td>
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The ACF’s Microcomputer Laboratories...

From its five locations, the ACF provides a wide variety of computers and related services for faculty, research staff and students. The map on the opposite page shows the ACF’s locations, and the hours of operation are listed beneath it.

For some ACF services, an account is required. Priority access to ACF microcomputers is available; see box at right.

The ACF offers hundreds of computers for use by members of the NYU community. For a partial listing of what is available, see the box at right.

Access to the ACF’s Instructional Micro Labs
NYU faculty, staff and students in degree or diploma programs may use the PCs and Macintoshes in the ACF’s computer labs without charge as general users. There is no application procedure; simply come to a lab with your current, valid NYU ID.

Obtaining an ACF Account.
For priority access to the labs at all times, and to use most other ACF computers and special equipment, you will need to have an ACF priority account. There are two kinds. Faculty, staff, and students working on faculty-sponsored projects can obtain individual accounts. Instructors can obtain class accounts that cover all the students in a course section. To apply for a priority account, please contact the ACF Accounts Office (Room 305 Warren Weaver Hall, 998-3035).

Students in courses associated with class accounts must register for computer use. They can do this from Jan. 19 through Feb. 8 at any ACF computer lab. For hours of operation and availability to general users and to holders of priority accounts, please see facing page.

The ACF recommends that instructors obtain an ACF Class Account whenever a course requires that students have access to computers. These accounts give students priority access to ACF computers, and the application procedure helps the ACF to ensure that the appropriate software and training sessions are available.

What’s Available at the Labs in the Spring of 1994
The following microcomputer equipment is available at the ACF’s instructional computer labs. All systems are connected to local networks and are linked to the campus-wide network, NYU-NET, and are connected locally to Novell-based file servers and laser printers. Over 100 packages of software are available. For hours of operation, see opposite page.

Third Avenue North Residence Hall, basement (86 computers):
- 7 DEC 486 computers with 8 MB of memory, 120 MB hard disks, and color monitors
- 30 IBM and IBM-type computers with VGA color monitors
- 19 Macintosh Ilsi computers with color monitors
- 30 Apple Macintosh SE computers, with two floppy drives

Education Building, 2nd floor (90 computers, excluding Arts and Media Studio):
- 21 Macintosh Quadra 700 computers with 80 MB hard disks, 20 MB memory, and 16-inch color monitors
- 2 Quadra 800 computers with CD-ROM drives and color monitors
- 6 Mac IIVX computers with CD-ROM drives and color monitors
- 16 Macintosh IIci computers with color monitors
- 21 Macintosh IIci computers with color monitors, and 17 MB memory
- 24 IBM PS/2 computers, model 55SX, with VGA color monitors

Tisch Hall, Room LC-8 (58 computers):
- 25 IBM PS/2 computers, model 55SX, with VGA color monitors
- 15 IBM PS/2 computers, model 30, with monochrome monitors
- 18 Macintosh Plus computers

14 Washington Place (62 computers):
- 25 DEC 486 computers with 8 MB of memory, 120 MB hard disks, color monitors and 486DX processors
- 7 Gateway 2000 computers with 486 processors, 8 MB memory, and Super-VGA monitors
- 30 IBM PS/2 computers, model 70, with VGA color monitors; 25 with numeric coprocessor and joystick...
Important ACF Telephone Numbers

ACF HelpLine 998-3333
Account Information 998-3035
Computer Documentation 998-3036
Innovation Center 998-3044
Statistical Consultants 998-3434

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
995-4343 9600, 14400
995-4335* 300–1200

*This number is recommended if you are using an older modem that has no error-correction.

Exceptions to regular hours: 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.

Hours at ACF Labs

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<tbody>
<tr>
<td>14 Washington Place*</td>
<td>closed</td>
<td>8:30 am – 11:30 pm</td>
<td>8:30 am – 11:30 pm</td>
<td>8:30 am – 5:30 pm</td>
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<tr>
<td>Tisch Hall*</td>
<td>closed</td>
<td>8:30 am – 11:30 pm</td>
<td>8:30 am – 11:30 pm</td>
<td>8:30 am – 5:30 pm</td>
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<tr>
<td>Education Building*</td>
<td>closed</td>
<td>8:30 am – 11:30 pm</td>
<td>8:30 am – 11:30 pm</td>
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<tr>
<td>Third Ave. North</td>
<td>10:30 am – 1:30 am</td>
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<tbody>
<tr>
<td>14 Washington Place</td>
<td>closed</td>
<td>9:00 am – 9:00 pm</td>
<td>9:00 am – 9:00 pm</td>
<td>9:00 am – 5:00 pm</td>
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<tr>
<td>Tisch Hall</td>
<td>closed</td>
<td>9:00 am – 9:00 pm</td>
<td>9:00 am – 9:00 pm</td>
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<tr>
<td>Education Building</td>
<td>closed</td>
<td>9:00 am – 9:00 pm</td>
<td>9:00 am – 9:00 pm</td>
<td>9:00 am – 5:00 pm</td>
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<tr>
<td>Third Ave. North</td>
<td>10:30 am – 10:00 pm</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>
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</table>

*Available to general users from 8:30 am to 1:00 pm, Mon. through Fri., and to priority access account holders during all hours of operation.
In This Issue

Networks
What’s New on the NYU CWIS: Kiosk, Cases, Grants, and More 1
What Is the NYU CWIS? 2
What Does a Gopher Go For? 3
Internet World Discovery Tour 5
Coming Soon: NCSA Mosaic 6

Social Science Computing
ARC/INFO Now Running at the ACF 9
Recent Census Material Available at the ACF Data Base Archive 11
ACF HelpLine Q&A: Using an Alias 12

Library Computing
UnCover and FirstSearch Databases Available Online 13

Humanities
Newbytes: Please Copy This Disk • How to Cite an Internet Document • TEXT Technology to Expand 14

Instructional Computing
I SEE! New Statistical Software Shown 15
Coming Colloquium: Visual Computer 16
ACF HelpLine Q&A: Correcting Mistakes in an E-mail Message 16
Newbytes: Free and Low-Cost Software for Teaching Mathematics • New Educational Discussion Groups 17
Remembering Max Goldstein 18

Supers, Mainframes, and Minis
Supercomputing ’93: Latest Evolutions in High-Performance Computing 19

Science and Visualization
Scientific Visualization: Highlights and Visions 23

At the NYU Computer Store
Multimedia Software and Peripherals 27

Arts and Media
Computer Metamorphoses: Image Manipulation as a Creative Tool 28
Software at the ACF’s Arts and Media Studio 29

Upcoming Events
Meetings of Interest 30
DIALOG Classmate Program 30

Spring ’94 at the ACF
Index of Classes, Workshops, and Talks 31
At the ACF Helpline 31
ACF Classes, Workshops, and Talks 32

ABC’s: 33 • Computers and Operating Systems: 34 • E-Mail and FAXmail: 35 • Geographic Information Systems: 36 • Graphics and Multimedia: 36 • Networks and Network Services: 36 • Scientific Computing and Visualization: 37 • Statistics, Spreadsheets, and Databases: 38 • Wordprocessing: 39

Important Dates for ACF Users 40
Calendar 41
General Microcomputer Lab Information 44
Map and Hours of ACF Locations 45

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