# Academic Computing and Networking at NYU

## SEPTEMBER 1991

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Academic Computing and Networking at NYU is edited and published by New York University's Academic Computing Facility (ACF). Formerly the Academic Computing Facility Newsletter, the new publication's broadened scope is intended to include 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 Documentation Office (Room 306 Warren Weaver Hall). Students holding ACF individual computer accounts are included automatically in the newsletter's mailing list. This is the first issue published in the 1991–92 academic year; four issues are planned. Contributions from sources within the University are invited for consideration by the editor.

Unless otherwise indicated, articles are authored by members of the ACF staff. This issue includes articles and information contributed by the following members of other departments and institutions: Genine Babakian (Bobst Library); Donald Chesnut (School of Law); Joan Connely (Fine Arts, FAS); Jennifer King (NYU Book Centers); Stephen Krause (Purchasing Services); Donna C. Kurtz (Ashmolean Museum, Oxford University); Richard Maisel (Sociology, FAS); Caroline Persell (Sociology, FAS); Tamar Schlick (Mathematics, CIMS and Chemistry, FAS).

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Those odd notes below many of the by-lines in this issue of the newsletter are electronic mail (E-mail) addresses. If you do not use E-mail but would like to, see the box in the Networks and Network Services section of this newsletter.
From the Director

The Evolving Nature of Central Academic Computing Services

Both computing and the roles of universities' central computing organizations have changed enormously over the past forty years. A shift, in the past ten to 15 years, away from the centralization of computer resources raises the question of how central computing organizations can most effectively serve their universities.

In the same period of time, there have been rapid strides in information technology—both computing and networking. In the following pages, I will describe my view of how these major changes, along with the trend toward the decentralized location and control of computer hardware, have resulted in the emergence of important new needs which central academic computing organizations like the ACF are well positioned to fill.

The article will begin with an overview of academic computing's early development as a centralized endeavor and of the more recent trend toward decentralization. It will go on to offer what I believe is an appropriate and contemporary redefinition of academic computing's distribution and scope. It will conclude with an outline of several broad roles and expanding areas in computing and networking that I believe are addressed most effectively by central organizations like the ACF.

Computing's Early Days

The commercial electronic data processing industry is now 40 years old. Starting with the installation of a Univac I at the U.S. Bureau of the Census in 1951, the industry has grown from one concerned with producing reliable high technology hardware to one which is oriented toward a whole spectrum of demands including those of the average consumer.

During this 40-year period, the electronics technology underlying computing has gone through many generations of technical change and progress. The cost-performance ratio of computing has decreased by about 25-30% every year, with no end in sight to such sustained dramatic improvement. Today's average microcomputer is in many respects far superior to early large shared computer systems.

During this period, the concept of software was invented. Software's less rapid but steady improvement continues to increase our productivity in exploiting computer technology. In the last ten years, the concept of software has taken on new dimensions with its dramatic expansion and growth in the consumer market.

Academic Computing Organizations

Universities were among the developers of the original generation of electronic computers, and were also generally quick to apply computers first to research in the physical sciences and later to other academic disciplines. Both government and industry, recognizing the potential of electronic computing technology, were at first very generous in funding initial and early replacement computer systems at major university locations.

Computing technology often entered universities as an adjunct to a substantive field that then depended for advancement upon the existence of computing machinery. Astronomy, mathematics, physics, and electrical engineering departments, among others, introduced electronic computing in various U.S. universities. The field of computer science per se had not been conceptualized at the time.

It soon became apparent that application of computing technology was destined to become widespread, and that computing would evolve as an independent professional field. Universities generally responded by creating centrally funded academic computing organizations with a mandate to provide computer-based service to parts or all of the university.

Two powerful forces were involved in shaping the centralized nature of early computing organizations. First, early computer systems involved multi-million dollar expenditures, and appropriate smaller computers either did not exist or were economically overwhelmed by the hardware economies of scale offered by large systems. Second, the amount of knowledge about computers on any one campus was quite limited, and the only effective way to gather a critical mass of skills and expertise to fulfill the service mandate was to centralize staff knowledgeable in the intricacies of the field. A strong reason for needing a significant critical mass of staff was that early computer-user interfaces were quite complex and required a cadre of technical intermediaries. For these reasons, the dominant initial model for the organization of computing was one of centralization of physical equipment and supporting staff. These centralization-encouraging forces existed well into the 1970's, but have since been weakened to a significant extent by more recent developments.

Since those early years of computing, some major changes have taken place. Early computers were expensive, and programmers were cheap; the reverse is true today. In the beginning years of the industry, there was more concern for the "work environment" of the computer and less for that of the staff; the reverse is true today. Machine (or capital) productivity used to be at the heart of efficient use of computing technology; staff (i.e., labor) productivity is central today. Economies of scale in hardware used to be very important. Today, they are often outweighed considerably by diseconomies of central control over resources.

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University communities have responded to these changes. Computing activity is being substantially decentralized throughout campus communities. For many purposes, neither hardware economics of scale nor a lack of computing skills is an important consideration with regard to a computer's location or the scope of its use. Computer systems and their use have penetrated most schools, departments and centers. Some universities have a greater than 1:1 ratio of computers to persons on campus, although most have a more limited stock. NYU has acquired well over 4,000 computers for institutional use over the past several years. There are no hard data available regarding personal ownership of computers by faculty, staff and students, but the level of ownership appears to be significant.

**Summary and implications.** Overall, the use of information technology has grown steadily and substantially over many years. In more recent years, the number of distributed systems managed in a decentralized manner has grown faster than the set of resources that is controlled and made available centrally.

Such a pattern is consistent with the greater efficiencies now possible through personal control over dedicated computing resources. This difference in growth rate, however, does not necessarily imply that universities' central resources should shrink in absolute size. Rather, it suggests that a higher growth rate for computing resources on a decentralized basis may be in the best interests of the University, but only so long as such investments and operations are made on the basis of good information and well-informed management. The central resource can contribute much to ensuring that these latter conditions can be met.

**What Role for Central Computing Facilities?**

The substantial decentralization of computing in organizations raises the question of what role is appropriate for central computing organizations. Within the context of NYU, the questions are how can a central computing organization best serve the academic needs of the University, and what does this imply about its organization and mandate?

These are important questions. At most universities in the country, the majority of funds that are spent on central academic computing are university funds, not grant or contract funds. For major research universities, this is a consequence primarily of a shift in Federal funding policies in the 1980's away from supporting central campus computing facilities and toward funding access to national supercomputers, on the one hand, and to procuring personal computers and workstations for individual researchers, on the other. This shift, which is nearly complete, suggests that most universities will rely primarily upon tuition and endowment income to provide central academic computing support.

Under such circumstances, it is important that the central academic computing facility and service organization — and, indeed each service organization within the University — ensure that its services are provided in an amount and composition that contributes most appropriately to the educational and research missions of the institution. At few universities today is there a feeling of sufficient financial comfort to allow patterns of organization, expenditure and service provision to persist for primarily historical reasons. In the present period of fluctuating economic activity and uncertainty about the economic future, it is important to ensure that a university's limited resources are invested effectively.

**Toward an Appropriate Definition of Academic Computing**

The ACF faces an important task, shared by other central academic computing organizations. That task is to redefine the appropriate distribution and content of academic computing as a field of endeavor, both now and in the future.

**Distribution**

The distribution of academic computing functions has been under discussion almost since computers were introduced into universities. Although, for computer hardware resources, the economies of scale were substantial for many years, this was not true for the early development of application-specific software. On the one hand, programmers working in a central computing group could enjoy access to the technical knowledge in a computing center. On the other, such proximity was often at the expense of sufficiently close collaboration between the programmer and the substantive experts needing to use the program. While initially most such applications programming was performed within computing centers, today application-specific work is generally done close to or in the end user group needing the results.

The distribution of hardware and of systems knowledge took longer to begin, but was encouraged by the emergence of minicomputers in the 1970's and microcomputers in the 1980's. Knowledge of computing technology and techniques should be — and is — flowing from central services to distributed groups and individual users.

**Components and interdependencies.** Thus, decentralization is not an all or nothing issue; there are many components of computing activity, and we must analyze each on its own merits while keeping in mind the interdependencies among components. Different components of academic computing support will behave differently with respect to decentralization — just as applications programming activity began to decentralize years before hardware. The task here is to identify those components and to understand the range of appropriate distribution for each, both organizationally and geographically, within the university.

Individual users and departments will respond differently to
the choices available to them within these ranges; what may seem optimal in one case, may be undesirable in another. In particular, the extent of a specific school or department's commitment to decentralized computing facilities and support may depend upon the unit's interest in computing and its ability to support various aspects of it locally. Different units will react differently to opportunities for decentralization or central support; a variety of different approaches by units in apparently similar circumstances may all be reasonable ones.

A major advantage of decentralization is the ability for a person or group to define and control their computing environment without interference. Having one's own dedicated hardware, software, and applications can be an attractive way to exert such control, and this model works well for some sets of applications, but not all.

However, along with the freedom to control one's own computing destiny come the responsibilities of obtaining, operating, and maintaining that environment. Persons operating a desktop computer often have no option to avoid being a little bit of a systems programmer, applications designer, operator, and maintenance engineer as the situation requires. Some will relish such a challenge; others will not want to bother and will subcontract the responsibilities out to the central computing or other organization.

**Appropriate distribution.** In my view, some computer facilities are still appropriately centralized, while others—depending upon the interest and ability of the particular unit involved—can and should be decentralized. However, the emergence of data networking on a large scale, and the integration of campus networks into an overall national and international network activity, argue strongly for central management of the campus network as a central resource linking the university's computers, and strong central co-ordination and guidance in its evolution. The issue of campus network management will be discussed in greater detail in the next major section of this article.

**Content**

What is the domain of academic computing? The appropriate applicability of computing technologies to the instructional and research enterprise can be defined in several ways. One approach—which could be termed user-oriented—is according to who uses the technologies. Academic computing could, for example, be defined as all computing performed for whatever purpose by the faculty and academic support staff of the university. While this approach might be appealing, there are two fundamental problems with it.

The first problem is that academic staff engage in some transactions that are clearly administrative in nature. For example, faculty and departmental staff submit grades and track account budgets; these functions may be computer-based and executed on behalf of the academic program, but they are as much administrative in nature as academic. On the other hand, Deans, department chairs, and faculty members write various kinds of letters, memos, research papers, and so forth. Generally there is strong academic content woven through many of their documents. In such an environment, should word processing support be regarded as an academic computing function? In a research university environment, where the conventional wisdom includes the phrase, "publish or perish", it seems that the answer must be at least a qualified "yes".

The second problem with this user-oriented approach is that it does not address the fundamental question of how much computing is enough to support the academic requirements of the university. Unless this question is to be left entirely for the market to resolve, it must be considered. Only by doing so, can we arrive at a definition of academic computing from which policy can be formulated regarding the range and extent of services that the central academic computing organization can and should offer to fulfill those requirements.

The problem of how much computing is complicated by the fact that needs are relative, and perceptions of needs change as a function of what problems and processes appear to be tractable, based upon current technology and costs. One might say that the availability of computing power creates its own demand by enabling scholars to do what was previously impossible or simply impracticable. For example, in the 1960's, a fairly common research use of computers at universities was to obtain multiple regression analyses of experimental and survey data. Such analyses, often involving 20-50 variables, could theoretically have been performed by hand in the 1940's, but it would have taken an army of statistical clerks months, if not years, to obtain the results. The availability of electronic computing power stimulated statisticians and social scientists to develop, implement, and apply numerical techniques that previously had been of only theoretical interest. Nowadays, entire packages of readily used statistics programs developed from this earlier work are assumed to be available at Universities as part of an essential set of scholarly tools, the presence of which helps validate the institution as a place of research and instruction.

**A definition of scope.** I propose that the appropriate scope of academic computing should be defined as any computer-based activity that adds non-trivially to the effectiveness of the University's instructional and research processes in their full generality:

- by increasing the insight gained in learning and in the production of knowledge; or
- by enhancing the utility and expediting the flow and distribution of new knowledge; or
- by increasing the productivity of students and scholars as knowledge workers; or

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by structuring and codifying knowledge so as to increase its value in instruction and research.

In addressing this scope of academic computing activity, universities will have to rely upon a range of technologies and techniques. Note, in addition, that our definition of scope, though broad, does not relieve us of the necessity of making choices and assigning priorities among competing demands in a world of limited resources. That aspect of academic computing is being dealt with in a long-term planning process, which the Academic Computing Facility is now initiating.

**Evolving Roles for the ACF**

I foresee a continuing need for organizations like the Academic Computing Facility, that occupy a central location within universities and offer central academic computing support to their schools and departments. The role which I envision entails a significant shift from the early paradigm of economically enforced centralization — a shift which, in fact, is in process both here at the ACF and at other universities' central academic computing organizations. This new role is no less important to the university in terms of helping it deal with the cornucopia and chaos of computing than has been the case in the past.

Shared machines will continue to offer benefits in the coming years, although their importance in the overall computing picture of the university is likely to decline slowly. Shared machines offer users remote operation and maintenance, file security and backup procedures, and no management responsibility for the operation beyond management of their accounts and personal files.

Shared systems are used substantially by physical scientists, whose models and investigations require fast processing and capacious memory. NYU's mini-supercomputers are frequently used by scientists developing programs prior to sending them to an NSF or DOE supercomputer site for execution. Social scientists use shared facilities to exploit their large file handling capabilities. Classes are assigned to use large shared systems because of the software available on them and their relative ease of administration for groups.

Shared systems can offer central services that users in a distributed environment need. File serving and database access are two of these services. Other important services are better characterized as network services and are discussed below; often they can be implemented most efficiently on shared machines.

Thus, NYU has some responsibility to provide public computing opportunities in the form of centrally administered desktop computing laboratories. The extent of such laboratories will vary over time and will be bounded from above by available resources and competing priorities. Such laboratories should be capable of being used in classroom training mode, with 1-2 students per computer when required, and should also be available for individual use for working on assignments. Although some departments and schools, having adequate resources, are investing in labs of this type, they are generally specialized and are limited to a restricted clientele. Facilities are needed for the "computationally
homeless"; they are a part of the ACF's constituency.

The need for such public facilities may disappear eventually, but it is likely to be with us for at least the next decade. The balance of equipment and software in the laboratories needs to track the requirements of instructors, take advantage of effective computing modalities and software offerings, and be sufficient to meet the formal instructional needs of students. In addition, it would be desirable if these facilities could be expanded to the point at which they could be regarded as a generally available university resource. Such a move would put central public computing facilities on the same basis as Bobst Library, which is a resource available to all NYU students without a requirement that they show a course-related need to use its facilities.

3. Management of networks and network services

Networks connecting computers and the network services that such interconnections make feasible are two of the most rapidly growing and exciting developments in academic computing today.

Networks. The concept of computer network was not visible at the beginning of the commercial computer industry. It was not until the late 1960's that, through the creation of the ARPANet, the long range potential of communication among computing systems could be understood and appreciated by the academic community.

Today computer communication is both a reality and a necessity. NYU-NET links almost 2,000 objects — computers, file servers, printers, gateways to departmental networks, and so on — on the NYU campuses, and new objects join the net with great frequency. Further, NYU-NET is tied into our regional network, NYSERNet (the New York State Education and Research Network), which in turn is connected to the NSFNet backbone network which spans the United States. Finally, NSFNet itself has linkages to similar research and education networks in some 40 or 50 other countries. The global village is here, and it is being realized electronically.

Networks are also of fundamental importance to the administrative and management aspects of academic institutions. Indeed, it would be difficult to conceive of NYU or any other major research university operating in the absence of networks capable of transporting academic data for administrative purposes. The capability for electronic information transfer has become an essential component of the administrative information infrastructure.

Campus backbone networks, such as NYU-NET, are akin in status to a public utility. They are expensive, so there can only be one of them. Their extension to additional campus buildings requires careful planning and investment. The underlying technology and communications protocols are complex and changing, so that intensive technical involvement is required for effective evolution and management of the network. This role is one that the ACF has had for a number of years and which the ACF is uniquely capable of executing.

Network management includes operating and managing gateways to external regional and national networks. As network services increase in importance, the function of authenticating network users and authorization to use services will assume as much or more importance than password protection has on today's shared systems. As the number of NYU-NET connections grows, and as the number of LLANs (Local Area Networks) attached to NYU-NET grows, network management is moving from an experimental status to one approaching public utility quality. Network management for academic purposes and its evolution is best handled within NYU by the ACF, acting in concert with the University's Data Communications Task Force.

Network Services. Network services are growing and are likely to be one of the most exciting aspects of academic computing in the next 5-10 years. The growth of network services is a reflection of the dramatic growth of the national research Internet, which now has well over 100,000 nodes and has direct links with similar (although smaller) networks in many other countries. Each node on a network, whether it is an NYU-NET node or associated with another institution, is capable of serving and consuming network services. The network is the glue that holds these nodes together and the electronic highway that provides the reliable and near-instant electronic transport enabling attractive network-based delivery of information services.

Major investments in intra- and inter-campus networking have been made in the last five years, and have been strongly encouraged and partially financed by the National Science Foundation. The initial primary motivation for this was to ensure that researchers at universities working on NSF (and other government supported) research projects would have effective access to NSF supercomputer centers to utilize that component of their funding provided by the NSF in the form of computing time. The original NSF supercomputer centers may therefore be thought of as the initial set of network services — high capacity computer servers — that drove NSF's networking program.

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The most common form of network service currently is electronic mail, or E-mail. E-mail is in widespread use both inside the NYU campus and between NYU personnel and others in other institutions. E-mail is an essential form of communication; it handles, inter alia, scholarly text, data transfer, recruitment correspondence, and conference arrangements and registration. It is used to manage remote facilities by people on sabbatical. Certain disciplines and activities have grown so dependent upon its existence that it would be unthinkable to reverse the clock and not offer the service.

Access to library catalogs is an example of an important network service. While access to Bobcat may be taken as a matter of course at NYU, how many people know that it is now possible to access the catalogs of more than 100 other libraries in a similar fashion? Recently, as an experiment, I accessed catalogs of libraries in Australia, New Zealand, and Mexico, and searched them for a few references. I accomplished this from my office in about 20 minutes by having an account on the ACF VAX Cluster, logging in and using the Telnet remote login protocol to make a connection with each of these libraries in turn. While my exercise was only technical to test the feasibility of such connections, it represented what I believe will become a frequent occurrence, with scholars searching specialized resource collections around the world with no more effort than is required for local access to Bobcat.

Many network services will be supplied to NYU faculty, staff, and students from external sources. However, there is a set of services that NYU will want to provide for itself, and some active guidance will be required to ensure that network services are launched internally in a manner that strongly encourages their success. While the ACF would not (even if it could) provide all network services at NYU, it provides several key services, e.g., electronic mail, white pages, bulletin boards, and an initial campus information system. Furthermore, there needs to be some unit on campus that coordinates network service offerings and proactively encourages the emergence of others so as to create a robust environment of such services. For the central academic computing organization to fill these coordinating and proactive functions is fundamentally consistent with that organization's management of the data transport mechanism, its gateways to external networks, and its knowledge of external network-based information services. The University's Data Communications Task Force performs a valuable advisory and guiding role in this regard.

Electronic network services are in their infancy. They have understandably been slow to develop in the absence of a widespread delivery mechanism providing them access to consumer markets. With the rapid proliferation of networks and their subscribers, network service providers are poised to take off and offer a variety of information services in the near future. NYU is well situated to take advantage of these forthcoming offerings by virtue both of its past investment in its campus network infrastructure and its current exploration of future evolution through the work of the Data Communications Task Force and the ACF.

4. Education, consulting and documentation

Central academic computing organizations have historically been the main source of education, consulting and information dissemination regarding computer technology. In the early years, these organizations effectively managed the introduction of computer technology onto campuses, as well as its subsequent growth, and there was often no alternative source of assistance in program development and computer use. A significant number of university computer centers developed their own operating systems, programming language translators (compilers), editors, and other system components — often in an effort to meet local computing needs — and as a result were the only source of information at the time for key aspects of a university's computing environment. While the range of products available to university users at the time was small, the products themselves were hard to use and demanded technical mediation between computer and user.

While today there are many alternative sources of information regarding computing technology and its role in the university, the case for central education, consulting and information services has never been stronger. Consider the following.

- In 1980, only a small percentage of the NYU community used computers; in 1990, close to a majority of us may be users.
- Education about computer technology in one form or other is rapidly becoming an essential part of liberal and professional education in developed countries.
- The amount of information about computer technology from all sources can easily overwhelm even the experienced user; the occasional reader or user is likely to be thoroughly confused.
- Investments in computing technology are now being made on a university-wide basis, generally by people who are not computer specialists, who can often benefit from assistance.
- Much of the benefit from having a computer can come from connection to the network and the network services that are available; guidance regarding how to realize those benefits should come from experienced practitioners in the field.
- With the growth of computing and networking on campus, there is substantial utility in disseminating information about its use

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3 The ACF does not work in isolation in this area. The University Library has significant knowledge of many kinds of information sources and services and significant expertise in providing access to such sources. The ACF works with Bobst Library in making the NYU community aware of such information sources and services.

4 An example of such a product is IBM's JCL for the System/360, which still must be used to some extent to exploit current IBM mainframe systems.
throughout the university community.

- Some computer related consulting is also substantive, such as in statistical computing; academic computing organizations have historically provided such a service to the entire university community because of the close relationship between substance and tools.

Maintaining a critical mass of skills in the application and use of computer technology remains an important function that can best be executed at NYU, as at other universities, by a central computing organization. Our users are generally not computer experts, and they appreciate our assistance. Furthermore, our student body turns over at about 25% per year and there is significant faculty turnover at the lower levels, yielding a significant stream of persons who require or demand access to assistance.

5. Provision of special services

Central academic computing organizations often offer specialized facilities and services. Such facilities and services are generally acquired and offered on the basis that no one user, department, or school might be able to justify acquiring such a resource, but that the resource can be used effectively across the university as a whole.

Resources offered by the Academic Computing Facility that fall into this category include the Visualization Laboratory, the Faculty Microcomputer Laboratory, and the Social Science Data Archive. The new high end Macintosh systems being installed this fall, with their specialized hardware and software for visualization, imagery and use of non-conventional media, are another example of such a specialized resource.

A major special service that is offered by the Academic Computing Facility is technology forecasting and assessment. Information technology is one of the fastest evolving fields of our era; the range of technical possibilities and product choices often overwhelms the casual user. ACF staff track information technology on a continuing basis and, with colleagues on the staffs of other organizations concerned with information technology, provide seasoned guidance regarding patterns of investment in the field and effective patterns of use of the technology. Such a function is most successfully performed in one or a few specialized organizations, rather than being repeated in piecemeal fashion by each of many casual users scattered throughout the university.

As computing continues to change, new specialized services and functions suggest themselves. For example, the ACF now has site license agreements with several microcomputer software vendors which result in major savings in software license costs for departments and individuals. The ACF has been able to negotiate economics with vendors in the area of University-wide discounts for procurement and maintenance, generating savings for users and departments that choose to use those vendors’ products. In this area, our role is shared with the NYU Book Center for individual microcomputer purchases and with the Purchasing Department for institutional microcomputer purchases.

Among the services that the ACF will offer soon is an expansion in instructors’ ability to use computers for instructional demonstrations within their classroom sessions. While currently our institutional capability to provide this function is extremely limited, we are adding two facilities that will be capable of being used in demonstration mode on an ad hoc basis sometime in the fall semester. Another such facility is planned for Fall 1992.

Central academic computing organizations are now becoming increasingly involved in fee for service, or contract services, operations when services desired are restricted to specific individuals or groups. Examples of such services are departmental network management, microcomputer repair, and workstation software upgrade and maintenance. The ACF’s service of installing new network connections to NYU-NET is essentially a fee for service operation, with user charges covering the equipment part of the service. The growth of decentralized computing is likely to increase the number of such special services that can be successfully supplied by central computing organizations on university campuses.

Summary and Conclusion

Computing has undergone enormous changes in the last 40 years. The role of central academic computing centers, once focused upon efficient use of a large central computer system, is now changing substantially. The decentralization of computer hardware has created major new needs which central academic computing organizations such as the ACF are well positioned to fill. A significant shift in paradigm is necessary to maintain the strong contribution of such organizations to the research and instructional needs of universities in the future.

Several broad areas suggest themselves as legitimate and, in some cases, expanding areas of opportunity for central academic computing organizations to make increasingly meaningful contributions to their university. These include central management of shared computer facilities, of public desktop computing, and of networks and network services; education, consulting and documentation; and provision of a growing number of specialized facilities and services. The taxonomy is relevant for suggesting future directions for the mandate and activities of NYU’s Academic Computing Facility.

(Comment on and criticism of the above views are welcomed.)

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NYU's Colloquia on Innovative Scholarly Computing

Spring '91 Series Concludes with Topics in Chemistry, Music, Policy Research, and Strategies in Computer Media Use

The latter weeks of NYU's Spring '91 colloquia on uses of computer technology in higher education drew speakers from the fields of chemistry, music, and public policy research, and two presentations on strategies for integrating multimedia technology into instruction and research.

The colloquia, now beginning in their third year, bring faculty and other noted speakers from universities around the nation — including NYU — to speak on innovative uses of computers in which they are involved. Presentations earlier in the 1990-91 academic year had featured faculty authored instructional software, databases and other applications in the humanities, sciences, language instruction and arts. (For reports on these, please see the November 1990 and the January and March/May 1991 issues of this newsletter.) As we go to press, a new series is being planned for the Fall '91 semester (please see item on page 10).

The series, which continues to gain in popularity, is sponsored by the Academic Computing Facility (ACF) and the Faculty of Arts and Science (FAS), with support from the IBM Corporation and Apple Computer, Inc.

**Animated Courseware for NYU Chemistry Students**

Instructional software developed at NYU for use by students of physical chemistry was the subject of a talk by Professor Benson R. Sundheim (Chemistry, FAS). This included animated and interactive material used for classroom demonstrations, for students' independent laboratory preparation, and for interactive experiments performed independently by students.

Prof. Sundheim presented samples of the courseware and noted some of the advantages that he sees in the use of computer-based tools — and, especially, animation — in presenting particular types of material. Animations are especially useful, for example, in relaying time-dependent information, and have a distinct advantage over textbook presentations in the conveying of multidimensional dynamic relationships.

Computer-based tools also allow instructors to present material simultaneously, rather than linearly, showing, for example, magnified views of parts of a system at the same time that the entire system's activity is displayed. Prof. Sundheim has also found that, with the independent pre-labs and experiments, students were able to cover much more material than would otherwise have been possible, and in some instances with greater understanding. Other pluses were the ability of students to control the rate and direction of their browsing of the material, and to interact with the software.

All of the courseware runs on Macintosh-based systems and was produced by Prof. Sundheim, some of it with design assistance from Rachel Leventhal, then a graduate student at NYU's Tisch School of the Arts. An assortment of development packages were used. Animations were done with Director, and an animated HyperCard stack allowed students to perform interactive experiments in chemistry independently, and to analyze and plot results via "excursions" to the WINGZ spreadsheet program and Mathematica.

In an article planned for an upcoming issue of this newsletter, Prof. Sundheim will discuss the courseware developed thus far as well the results of a new project.

**Computer Music and Perception**

Another colloquium featured Professor John M. Chowning, who directs Stanford University's Center for
Computer Research in Music and Acoustics (CCRMA) and who spoke on his research at CCRMA into perceptual issues bearing on the composition and performance of computer music.

Recent psychoacoustic investigations by Prof. Chowning and his associates have resulted in insights into both the perception of loudness and the ability of listeners to differentiate the "microstructure" of sounds — for example, as in the perception of orchestral music.

Prof. Chowning discussed these findings and played excerpts from some of his musical compositions. These resulted partly from his research and served to demonstrate some of the underlying physical, psychophysical, and engineering issues that he has been studying. This was an especially widely attended session, as Prof. Chowning's investigations relate to issues of interest in a number of areas, including signal processing, perception, cognition, music and digital technology.

Information Technologies and Public Organizations

The speaker at the next colloquium was Professor Andrew Gordon, who is director of the program on Information Technology and Public Policy in the Graduate School of Public Affairs at the University of Washington.

Prof. Gordon discussed and demonstrated some recent work that he and his colleagues have been doing on the use of information technologies in public organizations. This has involved study of the impact of data presentation on public policy making and related issues of public access to and interpretation of data.

Prof. Gordon presented two software packages that he and his associates have developed. Both provided simple, graphical, point-and-click interfaces to public data, with Boolean search capabilities and the ability to obtain information, if desired, at increasingly fine levels of detail. One program provided access to information on the City of Chicago's capital improvement plans, and a more recent program was developed for use by police departments for the display and analysis of data on crimes.

In the remainder of his talk, Prof. Gordon focused on social issues that arise when technological strategies are used in an attempt to solve complex communication problems.


Innovative Uses of Computer Media

At the last two colloquia of the season, Philip Galanter and Gary Greenberg spoke on strategies and methods used at Northwestern University for integrating computer media into instruction and research.

Both speakers were members of Northwestern's central academic computing organization and, particularly, its Advanced Technology Group (ATG), a group that was formed, with Mr. Galanter at its head, specifically to support and encourage innovative uses of new technology at Northwestern. ATG's initial focus has been desktop computer multimedia and data visualization. Its Computer Media Studio serves as a test bed for new computer media technologies and a facility where specific collaborative pilot projects with Northwestern faculty, staff and researchers are initiated.

The two presentations also included a videotaped "tour" by Mr. Galanter of the Studio, and discussions of strategies for obtaining grants and other types of vendor support for innovative projects.

Dr. Greenberg, who heads the Computer Media Studio, focused on resources that he has found to be critical for developing pilot projects and outlined strategies for faculty/departmental integration of computer media into professional activity and instruction. Examples of some of the work done at the Computer Media Studio were shown.

(An article by Mr. Galanter, who has recently joined the ACF staff here at NYU, appears on page 27.)

—Estelle Hochberg
hochberg@acfcluster.nyu.edu

And on the cover, counterclockwise, from upper left: (1) a magnified view of molecules in animation, from the pre-lab session on liquid-gas equilibrium (see facing page); (2) a still from an animated sequence showing the operation of a refractometer used in an experiment on binary fluids (courtesy of Prof. Benson R. Sundheim); (3) a sample from an application of ModelShop to aid in set design for theater production (courtesy of Dr. Gary Greenberg, ATG, Northwestern University). For vases, please see page 25.
Instructional Software Awards Are Announced

The eleven winners of EDUCOM’s fifth annual Higher Education Software Awards competition were announced recently. They included three “Best” and eight “Distinguished” awards for faculty-authored instructional software and curricular innovation in the humanities, law, mathematics, and engineering.

Notable in the 2011 competition was a significant increase in the relative number of humanities entries (and winners), and a continued increase in the overall sophistication and quality of the items submitted.

New Colloquia Planned for Fall 1991

A popular series of NYU colloquia will return in Fall 1991, with a fresh set of presentations on uses of computers in higher education curricula.

As we go to press, times and dates are still being arranged, but approximately eight new colloquia are planned. Speakers will hail from a number of different universities and other institutions of higher learning and research and will focus on the integration and use of computers and software into instruction and research in a variety of academic disciplines. Topics planned for this semester include applications in the fine arts and social sciences, non-Latin languages, music theory and research, psychology and human factors.

The colloquium series is sponsored by the Faculty of Arts and Science (FAS) and the Academic Computing Facility (ACF), with support from the IBM Corporation and Apple Computer, Inc. They are open to all NYU faculty, staff and students.

A related series of somewhat more technical talks is also being planned for the Fall ’91 semester. Topics planned thus far include uses of supercomputers in the sciences and in scientific graphics applications, and there will be a two-part, semi-technical introduction to the Connection machine. This series, co-sponsored by the ACF and Courant Institute of Mathematical Sciences, are also open to all NYU faculty, staff and students.

For further information...

Announcements of each presentation will be mailed out to faculty members several weeks prior to its date, and will also appear in the bi-weekly publication of NYU’s Information Center, the NYU Event Hotline. For additional information, please call the ACF at 998-3333.

—Estelle Hochberg

hochberg@acfcluster.nyu.edu

(continued on page 12)
ISEE, a Computer Program to Assist Students in Learning Statistics

NYU Faculty Develop Tool To Aid Students of Statistics and Research Methodology at NYU and Elsewhere

Statistics often proves to be a difficult course both for students, particularly those with a limited background in mathematics, and for instructors. Those parts of a statistics course which deal with statistical inference (sampling distributions, expected value, bias, standard errors, and so on), are difficult both to teach and to learn.

Help is on its way. A new computer program, ISEE, is being written in the University and will soon be available to help students at NYU and elsewhere to learn the basic concepts underlying probability sampling and statistical inference. The ideas behind ISEE were developed by Richard Maisel and Caroline Persell of the Sociology Department (FAS). It is being written and implemented under a grant from the Fund for the Improvement of Post Secondary Education (FIPSE).

A PC version of ISEE will be available in the fall of 1991. It will run on any IBM-type PC using DOS, so long as it has a hard disk and at least 640K of memory. A limited preliminary version of ISEE, already available for use, runs on the ACF’s cluster of VAX/VMS computers. Also available are manuals explaining how to use the preliminary program and describing many experiments in statistical inference that can be conducted using ISEE.

ISEE can be used in courses in a number of ways — for example, to illustrate points in a lecture, to run experiments in a laboratory session, or for homework assignments. It can also be used for self-study by students with some background in mathematics. The program does assume that the user knows some elementary statistical concepts, including mean, standard deviation, frequency distribution and histogram.

Learning by Experimenting

The acronym, ISEE, which stands for Introduction to Sampling Error Experiments, expresses the philosophy underlying the program. ISEE allows students to see the results of empirical experiments in which they sample known populations under varying conditions. By seeing the error which actually occurs in an experiment, students develop an understanding of the potential for error in the various sample designs.

For example, using ISEE, a student can select hundreds of samples of different sizes from a given population distribution, such as the population size of cities of 20,000 or more in the United States. By comparing the sample estimates of the average population size with the known population average, students can see the effect of sample size on the error in estimating a mean.

The program allows users to vary the estimate, the sample size, the population distributions, the order in which the population is listed, the method of selecting the sample and the response rate (the rate at which information is obtained for selected sample members). By observing the effect of the varying conditions on the sample estimates, students using ISEE can learn the meaning of basic concepts such as sampling distribution, expected value, systematic and random error, bias, standard error, and others. Once students grasp these basic concepts, it is easier for them to understand the formulas in which the theory is expressed. Experiments can also be conducted which test the formulas, thus establishing their validity.

ISEE can also be used in courses on research methods to illustrate different ways of selecting samples, the effect of non-response on the validity of a survey, and the relative precision of the different sample designs.

A Range of Sampling Experiments

The program consists of five modules offering, respectively, illustrative examples of sample selection and sampling distributions; preliminary experiments with a small population

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(N=12); sampling experiments using univariate estimates; sampling experiments using bivariate estimates; and sampling experiments using cluster samples.

The first module illustrates five different ways of selecting a probability sample (simple random, systematic random, replicated systematic random, stratified, and Deming thin zone sampling). It also shows how a sampling distribution is generated. This module requires an EGA, VGA, or Hercules graphics card in the PC.

The second module allows the user — whether students or instructor — to conduct many very simple and quick experiments sampling a small (N=12) artificial population. Users can enter and analyze their own population distributions, sample them in three different ways (simple random with and without replacement and systematic random), vary the sample size, and introduce nonresponse. This module provides an introduction to the subject and the use of the ISEE program.

The third module allows the user to conduct a wide variety of experiments with univariate estimates (means, proportions or totals) on populations or sub-populations with up to 50,000 cases. The experiments can be conducted using the six population files which are part of the program or with other populations supplied by the user. Users can select varying sample sizes for stratified samples, simple random samples (with or without replacement), systematic random samples or replicated samples. The user can reorder the population listing or introduce complex models for nonresponse. Experiments selecting hundreds of samples can be conducted in a few minutes.

The sample estimates can be analyzed or compared to the population parameters using listings, histograms, frequency distributions, or through calculating standard errors, expected values, and so forth. This module can also generate samples which students can analyze in homework or laboratory exercises.

The fourth module is similar to the third module but extends the estimates that can be used in the experiments to variances, standard deviations, covariances, ratios, correlation coefficients, and regression coefficients. Stratified sampling cannot be done in this module.

The fifth module, which will not be ready until some time later next year, extends the experiments to cluster samples.

For Further Information
While the program is being developed within the Sociology Department, the intention is to make it available to faculty throughout NYU for use with their courses. Anyone who would like further information about the program, or who would like to try it out, should contact Richard Maisel at 998-8353 or via E-mail (see below).

—Richard Maisel (maisel@acfcluster.nyu.edu) and Caroline Persell (persell@acfcluster.nyu.edu)

(Professors Maisel and Persell are members of the Sociology Department, FAS, of which Prof. Persell is Chair.)

(Awards, continued from page 10)

Dartmouth).

- Law Software: Park’s Evidence Exercises by Roger Park (University of Minnesota Law School).
- Mathematics Software: Combinatorica by Steven Skiena (State University of New York - Stony Brook).
- Mathematics Software: GyroGraphics (3.0), Jerry Johnson (Oklahoma State University).
- Special Recognition: A la rencontre de Philippe by Gilberte Furstenberg, Janet H. Murray, Stuart Malone, and Ayshe Farman-Farmaian (Massachusetts Institute of Technology).

The Awards program was established in 1987 to improve the quality of educational software and to promote the effective use of computer technology in higher education. Now based at the University of Maryland at College Park, it was originally located at the National Center for Research to Improve Postsecondary Teaching and Learning (NCRIPTAL) at the University of Michigan.

For additional information on the Higher Education Software Awards program and its 1992 competition, please contact Gail Miller at the University of Maryland at (301) 405-7534 or gmiller@cristal.umd.edu.

—from an EDUCOM release

Apple Publications on Instructional Computer Use
Three publications from Apple Computer, Inc. offer tips and guidance to faculty interested in integrating the use of Macintoshes into their courses.

Copies of Teaching with Computers, Basic Tools: A Software Guide for Faculty, and Multimedia: Getting Started are available for examination at the ACF (inquire in Room 306, Warren Weaver Hall). They can be obtained, free of charge, from Apple Technology Guides, c/o Syllabus, P.O. Box 2716, Sunnyvale, CA 94087 (E-mail: heguides@applelink.apple.com).
Scholarly Conferences Via Network

Recently Established BITNET Discussion “Lists”

Electronic conferences like the BITNET discussion "lists" allow scholars at universities around the world to exchange information and views quickly and conveniently via international networks. Recently established BITNET discussion "lists" include the following.

- Cross-disciplinary analysis of ancient texts. This list provides a forum for scholarly, informal discussion of the social worlds behind and within the texts of antiquity, including those of the Hebrew bible, early Christianity, Rabbinic Judaism and all the literature associated with the Graeco-Roman world. Subscription address: LISTSERV@GWUVM List name: HUMEVO
- Human evolutionary research. Moderated by the International Institute for Human Evolutionary Research at George Washington University in Washington, DC, participants in this discussion list examine human biological evolution, adaptation, variation, and evolutionary medicine. Sub-areas include interactive newsletter, hotline, bulletin board, cooperation column, research, and education. Subscription address: LISTSERV@GWUVM List name: HUMEVO
- Cross-disciplinary analysis of ancient texts. This list provides a forum for scholarly, informal discussion of the social worlds behind and within the texts of antiquity, including those of the Hebrew bible, early Christianity, Rabbinic Judaism and all the literature associated with the Graeco-Roman world. Subscription address: LISTSERV@GWUVM List name: HUMEVO
- Human evolutionary research. Moderated by the International Institute for Human Evolutionary Research at George Washington University in Washington, DC, participants in this discussion list examine human biological evolution, adaptation, variation, and evolutionary medicine. Sub-areas include interactive newsletter, hotline, bulletin board, cooperation column, research, and education. Subscription address: LISTSERV@GWUVM List name: HUMEVO

Subscribing to Discussion Lists from NYU

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

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SUBSCRIBE list_name your_name
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replacing "list_name" with the appropriate list name (e.g., CONTEX-L) and your_name with your first and last name — for example,

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SUBSCRIBE CONTEX-L MARY SMITH
```

Send the message to the "subscription address" listed in the article. If you are using an Electronic Mail Account or a regular account on the ACF cluster of VAX/VMS computers, use the address format: in%"subscription_address" (for example, in%"listserv@uottawa"). On the UNIX and VM/CMS computers, you may use the address in the format shown in the article (e.g., listserv@uottawa).

To obtain an E-Mail Account...

The ACF's Electronic Mail Accounts are available free of charge to NYU faculty, staff, and students. Electronic mail (E-mail) is also available automatically to individuals with accounts on ACF mainframes and minicomputers.

NYU students, faculty and staff members may apply for E-mail Accounts at any of the ACF microcomputer labs (see inside back cover for locations and hours). You will need to complete a very brief application form and to show your current, valid, NYU I.D.

Faculty and staff members, if they prefer, may also request E-mail Accounts by letter. Please use departmental letterhead showing the department's address and phone number, and include your name, title, 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.
Directory of Scholarly Electronic Conferences Available

The third edition of a Directory of Scholarly Electronic Conferences has recently become available and can be obtained in online format by electronic mail from Kent State University.

The directory is contained in several files, each of which can be obtained by sending the appropriate E-mail message (see accompanying box) to listserv@kentvm.edu. Users of the ACF’s cluster of VAX/VMS computers (including Electronic Mail Account holders) should use the address format in % "listserv@kentvm.edu".

You will receive an online message when the file has arrived. If you requested the file from a regular VAX/VMS account, you can retrieve the file by typing RECEIVE ACADLIST.filetype at the VMS $ prompt. You may then TYPE the file to list it on your screen, view it with your preferred editor, print it, and so on, as desired.

If your request was made from an Electronic Mail Account, please send E-mail to comment asking for assistance in retrieving the file.

—reported by Jeffrey Bary

A New Catalog of Electronic Publications and Lists

The first edition of a Directory of Electronic Journals, Newsletters, and Academic Discussion Lists has just been announced by the The Association of Research Libraries.

The ARL directory is derived from widely accessible networked files maintained by its authors, and will point to these files as the principal, continuously updated, and free-of-charge sources for accessing such materials.

The directory is available in a 180-page paper-printed version or on 3.5-inch diskette as a WordPerfect (for DOS) or Microsoft Word (for Macintosh) file. A hypertext version is also in preparation.

A reference copy has been ordered by the ACP; please contact ACP Information Services (998-3036) if you would like to examine it. To order your own, please send a check or money order for $20.00 made payable to ARL to Office of Scientific & Academic Publishing, Association of Research Libraries, 1527 New Hampshire Avenue, NW, Washington, DC 20036. (The fee for ARL institutional members is $10; non-members ordering more than 5 copies receive a 10% discount.)

— from an ARL release

Also of interest...

An article on a network-accessible database of ancient Greek pottery appears on page 24.
Access Via E-Mail to Mathematical Software

Information and Software Via Network from NETLIB

A collection of public-domain mathematical software is accessible via electronic mail. The collection, NETLIB, includes the source code for such popular libraries as LINPACK and EISPACK, and of many other less frequently used mathematical and statistical routines, as well.

How NETLIB Works

NETLIB users send requests and receive replies via electronic mail (E-mail). Requests can be for information about NETLIB and its components or for the actual source code (usually in FORTRAN) of a program. Several types of searches can be made by E-mail, including keyword searches for types of applications within the NETLIB collection, bibliographic searches, and searches for information on individuals in the SIAM membership list.

This network service is maintained by Jack Dongarra and Eric Gosse, formerly of the Argonne National Laboratory, now at the University of Tennessee.

Accessing NETLIB from NYU

To access NETLIB from NYU, send an E-mail message to netlib@research.att.com. Use the address format in%"netlib@research.att.com" if you are sending E-mail from the ACF cluster of VAX/VMS computers; from an IBM VM/CMS system, use netlib at research.att.com instead. If you are working from a computer that has uucp connections, you may also send E-mail to uunet!research!netlib.

You can obtain a listing of NETLIB's contents, by sending an E-mail message should consist solely of the command send index (see accompanying example). You will receive an E-mail message providing instructions on retrieving software as well as information about the collection itself.

Some Words of Caution

Although much of the software within this collection is robust and thoroughly tested, it is advisable that you test it yourself. An E-mail address to which you can send comments or bug reports, should problems arise, is included in the NETLIB index. If you seek the advice of ACF consultants about NETLIB, please make sure to inform them of the origin of the software and whether or not you have modified the source code further, so that they can properly assist you.

—Ed Friedman
friedman@acfcluster.nyu.edu

Network-Accessible Preprints in Mathematical Physics

An electronic archive for preprints in Mathematical Physics has recently been established by H. Koch, R. de la Llave, C. Radin of the Department of Mathematics at the University of Texas (Austin). Scholars in the mathematical physics community may retrieve preprints from the archive and deposit their own, all via electronic mail (E-mail).

Use of the archive is free of charge. For complete instructions, send an empty E-mail message to mp_arc@math.utexas.edu. Use the address format in%"mp_arc@math.utexas.edu" if you are using an ACF E-mail Account or a regular account on the ACF cluster of VAX/VMS computers; from the IBM VM/CMS system, use mp_arc at math.utexas.edu instead.

The new archive is expected to make the distribution of preprints considerably faster and less costly than more conventional distribution by regular mail. Eventually, keyword searching of archive contents will also be possible.

The archive will also serve as a repository of mathematical physics scholars' E-mail addresses to which archive users may voluntarily add their own.

—adapted from an electronic bulletin
ACF Opens New Micro Lab

Also in Fall '91: More Macintosh Resources, Multimedia, and An Expanded Program of Free Access to PC’s and Macs

There will be some exciting additions to the microcomputer resources which the ACF offers to NYU students and faculty this fall. At the ACF’s 14 Washington Place site, the ACF is opening its newest microcomputer lab, where Macintosh computers will now be available. A greater number of micros — both PC’s and Macs — are being offered at the ACF’s Tisch Hall computer lab, and the ACF is expanding its policy of providing free access for NYU students, faculty and staff to the IBM PC’s and Macintoshes at its four microcomputer labs. And planned for late fall is a new facility offering specialized resources for applications in the arts and media.

A New Microcomputer Lab

As we go to press, a new computer lab is being readied for use at the ACF’s Washington Place site. Slated to open the third week in September, the ACF’s fourth and newest public micro lab will initially offer some 40 new Apple Macintosh Ilsi computers.

The Ilsi is a powerful, mid-range Macintosh model. Each of the new lab’s Macintosh Ilti’s will be equipped with a color monitor, a 40-megabyte hard disk, and sufficient memory to run higher-end software for such applications as data analysis and work involving color renderings.

All equipment in the lab will have fast Ethernet connections to an IBM Model 95 Novell file server offering a wide selection of software packages, as well as several PostScript laser printers.

As is the case at all of the ACF’s microcomputer labs, the equipment in the lab will be linked to NYU-NET, NYU’s University-wide network. The NYU-NET links will allow connections from each computer to many other network-accessible computers and services within and outside of NYU — including BobCat and other online library catalogs; electronic mail; the ACF’s larger shared

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At the ACF's Instructional Micro Labs for Fall '91

NYU students, faculty, and staff may use ACF microcomputers under three types of accounts, at no charge to the individual: private microcomputer accounts, individual ("research") accounts, and class accounts. The latter two types of account are issued for specific academic purposes and allow priority access to ACF computers.

**Obtaining an ACF account.** For a private microcomputer account, simply bring your current, valid NYU ID to any of the labs listed below and complete a brief application form; your account will be established on the spot. Individual and class accounts (also called priority access accounts) are obtained through the ACF's Accounts Office (Room 305 Warren Weaver Hall, 998-3035). For priority access accounts, a special form must be filled out and, for students requesting an individual account, an instructor's signature is required. Please consult the Accounts Office for details.

**What's available at the labs in Fall '91.** The following microcomputer equipment is available at the ACF's instructional microcomputer laboratories. All systems are connected to local networks linked to the campus-wide network, NYU-NET, and are connected locally to Novell-based file servers and laser printers. A large collection of software (over 60 packages) is available. For hours of operation, please see inside back cover.

### Third Avenue North Residence hall, basement (62 computers):
- 32 IBM and IBM-type computers with mouse and VGA color monitor
- 30 Apple Macintosh SE computers, with two floppy drives
- 1 Hewlett-Packard LaserJet III printer and 2 Apple LaserWriter NT printers

Currently available to private micro account holders and to instructional/research users (students and faculty with individual and class accounts) during all hours of operation (see inside back cover).

### Education Building, Second floor (80 computers):
- 35 IBM PS/2 computers, model 55SX, with mouse, VGA color monitor
- 35 IBM PS/2 computers, model 70, with mouse, VGA color monitor; 25 with numeric coprocessor and joystick
- 10 - 12 high-end Macintoshes with specialized peripherals
- 1 HP LaserJet III printer, 1 HP LaserJet III printer, 1 Apple LaserWriter II NT printer

Currently available to private micro account holders from 8:30 a.m. to 1 p.m., Mon.-Fri., and to instructional/research users (students and faculty with individual and class accounts) during all hours of operation (see inside back cover).

### Tisch Hall, Room LC-8 (43 computers):
- 10 IBM PS/2 computers, model 55SX, with mouse, VGA color monitor
- 13 IBM PS/2 computers, model 30, with monochrome monitor
- 20 Macintosh Plus computers with hard disks
- 1 Hewlett-Packard LaserJet III printer and 1 Apple LaserWriter II NT printer

Currently available to private micro account holders and to instructional/research users (students and faculty with individual and class accounts) during all hours of operation (see inside back cover).

### 14 Washington Place (40 computers):
- 40 Macintosh Ilti computers with hard disks and color monitors
- 2 or more PostScript laser printers

Available to private micro account holders from 8:30 a.m. to 1 p.m., Mon.-Fri., and to instructional/research users (students and faculty with individual and class accounts) during all hours of operation (see inside back cover).
machines; and many other computers, databases, and services both within and outside of NYU.

The lab will be available six days a week, during all hours of operation, to classes and individuals with ACF priority accounts; it will be available mornings, Monday to Friday, to holders of the ACF private microcomputer accounts (see accompanying box).

Specialized Arts and Media Resources

Also planned for the Fall '91 semester is a new facility with about ten or twelve new higher-end Macintosh IIsi's. These will be outfitted with specialized peripherals, including CD-ROM's, video capture boards, VCR's, laser disk players, color scanners, large 24-bit color displays, and tablets with wireless styli. There will also be an assortment of such special-purpose software packages as Photoshop, Swivel 3D, Macromind Director and 3D, Renderman, Quark Xpress, PixelPaint, and Studio 32. Headphones will be available to support instruction in music and other applications — language and integrated media, for example — where audio is required.

At present, two uses for these specialized resources are foreseen. They will be particularly useful to students and faculty who are interested in applying computer technology to the arts and media, especially in areas like creative animation, photography, set design, two-dimensional design, high-end publishing and interactive multimedia. (See page 27 for more on a new ACF service in support of the arts and media.)

In addition, these high-end Macs will be well-suited for use with interactive, multimedia instructional software — typically faculty-authored — in a variety of disciplines. While the Macintosh IIsi's at the 14 Washington Place lab will be able to handle most such interactive "courseware", some will require specialized peripheral devices.

The new facility will be housed initially at the ACF's Education Building computer lab, and is expected to be in place by November.

Expanded Free Access to PC's and Macs

This semester also brings an expansion of the ACF's program of free access to its microcomputers. Since the Fall '90 semester, anyone with a valid NYU I.D. has been able to obtain an ACF private microcomputer account. These accounts give access, free of charge, to the PC's and Macs in the ACF's computer labs, but with some restrictions on hours and priority of service (see box for details).

This year, there will be a substantial increase in the resources available to private account holders: there will be more labs available to them and for longer hours of availability. As in the 1990-91 academic year, the Third Avenue North lab will be open to private account holders seven days a week during all of its extensive hours of operation. This year, in addition, the ACF's Tisch Hall computer lab — which last year was accessible only to instructional and research users (holders of ACF individual and class accounts) — will also be available to private account holders, six days a week, during all of its hours of operation. Both the Education Building lab and the new lab at 14 Washington Place will be open to private account holders from 8:30 am to 1 pm, Monday - Friday.

As another plus for private account holders, the Tisch Hall computer lab, in addition to the 23 IBM PS/2's with which it opened last year, now offers 20 Macintosh Plus computers, each with a new hard disk to add to its functionality. These were moved to Tisch from the ACF's Education Building lab at the end of the summer and will add to the total Macintosh resources available from the ACF for private account holders.

—Estelle Hochberg

(hochberg@acfcluster.nyu.edu)

Faculty Microcomputer Lab Has Moved

The ACF's Faculty Microcomputer Lab has been moved. It is now based in Room 312 Warren Weaver Hall.

The ACF's Faculty Micro Lab is a place where NYU faculty, research, and administrative staff can learn about different kinds of microcomputer hardware and software and obtain expert advice in the selection and use of personal computers, workstations, departmental networks, and related products. Visits to the Lab are by appointment. Please call 998-3044 to arrange a time. Hours between noon and 8 pm, Mondays through Fridays, are usually available.
Update on the STONED Virus

Greater Care in Protecting Against Virus is Urged

In the past four months, since the first occurrence of a computer virus at the Law School, there has been some misinformation regarding computer viruses, and in particular, regarding the STONED virus. Here is an update of what we know about STONED. (Our thanks to Moy Wong, who provides PC support to the Department of Psychology (FAS), for bringing some of these points to our attention.)

STONEED is a boot sector virus, which means that the virus copies itself onto the boot sector of a floppy or hard disk. Since the boot sector contains critical information necessary for a disk to operate properly, it is important that this virus does not reach the point where it causes damage.

New Information About STONED

Contrary to what we originally thought, the STONED virus is spread quite easily: the virus can infect a hard disk when the user copies files from a floppy disk or asks for a DOS directory of a disk. We originally believed that most users with standalone PCs were not at high risk for virus infection; now it is apparent that even if the PC is not connected to a network or a bulletin board service, etc., it is still easy for it to be infected.

Although in most instances where we have encountered the virus there has not been actual data loss, it is very important to clean the virus off of any disk before it does cause data loss. Also, cleaning your disks of the virus reduces the chances of spreading the virus to another disk.

Virus-Removal Programs

A virus removal program from McAfee and Associates is successful at removing the virus from an infected disk and is very easy to use. We recommend that you get a copy of it if you think your disks might contain the virus.

If you are associated with the School of Law, you can obtain a copy of this program from the Law School's Micro Support Services Department (998-6111). All other NYU faculty and staff may obtain copies from the ACF's Faculty Microcomputer Lab (998-3044). There is no charge for this software, but you should bring a blank disk.

—Donald Chesnut

Tips for Users of WordPerfect 5.1

The Law School is now using Version 5.1 of WordPerfect. Here are answers to a few common questions about the program.

To Customize Your Copy

To make changes to WordPerfect's default settings, you need to get into the System Setup menu by pressing shift and F1. Here are two commonly requested changes to WordPerfect 5.1's defaults.

If you prefer left-aligned text to fully-justified text, you can change the WordPerfect default to left-aligned by first entering the System Setup menu (Shift + F1). At this point, hit '4' for Initial Settings and then '5' for Initial Codes. To turn off right-justification permanently, press shift-F8 for Format, 1 for Line, 3 for Justified, and 1 for Left. To exit the System Setup menu, hit the F7 key three times.

Some users of WordPerfect prefer the status line display (that appears on the bottom of the WordPerfect screen) to display the cursor position in line numbers rather than inches. The WordPerfect 5.1 default is in inches. To change the status line display to show the line number, (Shift + F1), hit '3' for Environment, and then '8' for Units of Measure. At this point, you can change the status line display by hitting "2" for Status Line Display and entering 'u' for WordPerfect 4.2 Units. If you also wish to change the units of measure for margins and tabs, you can also do it from this menu by hitting '1' and then 'u' for WordPerfect 4.2 defaults. Again, to exit the System Setup menu, hit the F7 key.

Paragraph and Section Symbols

To display and print the paragraph and section symbols (¶ and §) that are commonly used in legal writing, there is a different method than in WordPerfect version 4.2. For the paragraph sign, hit CTRL + V, type in "4,5", and hit ENTER. For the section sign, the steps are similar: CTRL + V, type in "4,6", and hit ENTER. If you wish, you can automate these keystrokes by creating a macro. The section and paragraph signs will now appear on your screen, not only when you print the document.

—Donald Chesnut

(Donald Chesnut is the manager of the MicroSupport Services Department at the School of Law)
Social Science Computing

New Census Files to be Available from ICPSR

National 1990 Data Accessible to Scholars through NYU's DBA Archive

Data files from the 1990 Census of Population and Housing in the United States are becoming available from the Inter-University Consortium for Political and Social Research, and, through the ACF's membership in the ICPSR, these files can be acquired in machine-readable form by NYU scholars for research or instructional use.

The files that have been made available to date (August 6) are the PL 94-171 files containing the Public Law 94-171 counts (i.e., the Congressional redistricting counts), and STF1A (Summary Tape File 1A) files for 35 states. ST files contain various aggregations of the full data, grouped into different size units. The current plan at ICPSR is to make STF1A, B, C, and D files available as they are delivered by the Census Bureau in 1991 and 1992.

Files are presently being distributed on magnetic tape and can also be transferred via electronic file transmission using the National Science Foundation network (NSFnet), to which NYU's campus-wide network, NYU-NET, provides access. ICPSR is also developing a subsetting capability which will permit a user to extract only that portion of a Census file that is needed for his or her particular research or instructional application.

Also of Interest...

An article about ISEE, a computer program written at NYU to assist students of statistics appears on page 11.

Data Sets Recently Acquired by the ACF's Data Base Archive

The following are some of the data sets that have been acquired by the ACF's Data Base Archive since the last report in the March/May 1991 issue of this newsletter. (The ICPSR numbers, included below for your convenience, are reference numbers assigned by the Inter-University Consortium for Political and Social Research, the organization from which these files were obtained.)

- Current Population Survey, May 1984: Adult Education. This survey of 165,991 records has 175 items regarding labor force activity, adult education participation and demographic data. (ICPSR 8461).
- Current Population Survey, May 1985: Work Schedules, Multiple Job Holdings, and Premium Pay. This is the first CPS survey to ask questions about temporary work and about primary job-related activities completed at home. This file of over 200 variables for 165,498 cases has information about labor force activity, work schedules, and overtime. (ICPSR 8663).
- Census of Population and Housing 1980: American Indian Supplementary Questionnaire Public Use Microdata Sample. This file provides information on the American Indian, Eskimo and Aleut population beyond what is already collected in the 1980 Census. (ICPSR 8663).

(continued on following page)
New Equipment at Bobst Will Aid Visually Impaired

Adaptive Computer Technologies Offer Greater Academic Independence for Students with Disabilities

A few years ago, access to library materials represented one of the last remaining hurdles to the academic progress of the disabled, many of whom relied on readers to access both print and online resources. Recent advances in the efficiency and affordability of adaptive computer technologies, however, have made it possible for the visually and learning disabled to have direct access to these materials, offering them a chance for newfound academic independence.

A Large-Print Display Processor

Bobst Library, in conjunction with the Office for Students with Disabilities, has already introduced many such innovative technologies to support the research of the disabled community. Most recently, Bobst introduced the DP 11, a large print display processor by Visualtek. This new hardware, with a 20" monitor, control panel and closed-circuit magnifier, enables partially sighted students to enlarge text from 2 to 16 times. It also has split screen capability, which allows users to work in a software application on one half of the screen while reading enlarged text from the other. With the DP 11, a visually impaired student or faculty member may also access BobCat and other online catalogs.

Other Services for Disabled

The DP 11 is the Library’s most recent addition to a growing list of services for the learning and visually disabled. Since introducing its first Kurzweil Reading Machine in 1982, Bobst has continued to incorporate new adaptive technologies such as a braille printer, a large-print video reader, and a new Kurzweil Personal Reading Machine, which scans printed materials and translates them into audible words or characters. And coming this fall, a speech synthesis package, VERT, will be installed on one dedicated PC, allowing users to hear words or characters as they type.

Furthermore, since these services were relocated to the Bobst’s Microcomputer Center on B-Level, disabled students may not only find all of the equipment they need in one central location, but they are also able to access any of the Center’s software applications. Indeed, with more than a dozen programs stored in its Novell network, the Microcomputer Center represents an ideal host environment.

orientations on the use of adaptive computer technologies for the disabled are scheduled for the beginning of the semester or by appointment throughout the year. Those who are interested in attending should call Tom McNulty at 998-2519.

—Genine Babakian
Special Events Coordinator,
Bobst Library
babakian@acfcluster.nyu.edu

(continuing from preceding page)

Experience, demographic, socioeconomic data and general economic data for the locality (ICPSR 7610).
• National Longitudinal Surveys of Labor Market Experience, 1966-1987. These surveys focus on 5 cohort groups defined by gender and age. Major topics probed included the respondent’s labor market

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 catalogues some 700 studies represented by over 2000 data files. More are being acquired continually at the request of researchers at NYU. For additional information on the DBA’s services, or for help in making use of them, please contact ACF consultants Bob Yaffee (998-3402) or Bert Holland (998-3401). Full descriptions of all DBA holdings may be seen by using ACF’s INFO system, and selecting FACILITIES, and then DATABASES.

—Lisa C. Barnett (barnett@acfcluster.nyu.edu) and Bert Holland (holland@acfcluster.nyu.edu)
NYU's Computer Fair III is Coming in September

As we go to press, another exciting and informative Computer Fair is being planned. NYU’s third annual Computer Fair, co-sponsored this year by the NYU Book Centers and the Academic Computing Facility, will be held September 24 and 25, from 10 am to 5:45 pm, in the north lobby of the Loeb Student Center.

Representatives of many of today’s most popular providers of computers and computer-related materials — Apple, IBM, Zenith, Aldus, Lotus Development, Microsoft, to name just a few — will provide a first-hand look at the latest in desk-top products that the computer industry has to offer.

Hands-on demonstrations of hardware and software will give new and experienced computer users a chance to assess current computing products, to take a close look at some of the most popular computers and computer accessories, and to evaluate what can best meet their needs.

The Computer Fair is a good starting place for anyone who is interested in purchasing computer products but is confused by the myriad of items offered today by the computer industry. Also, the NYU Book Centers is able to offer many of the items at substantial educational discounts for NYU students, faculty, and staff.

And for Fair visitors who are interested in finding out about public computing facilities at NYU, Academic Computing Facility staff members will again be on hand to answer their questions and to give updates on new developments at the ACF.

So mark off your calendars now.

We look forward to seeing you at the Fair!

—Jennifer King
(king@acfcluster.nyu.edu)
with Lu Ratunil
(ratunil@acfcluster.nyu.edu)
(Jennifer King is Manager of the NYU Book Store’s Computer Department.)

New Products from Apple

Apple has announced a number of enhancements in its printer "family". The StyleWriter Printer and the Apple Personal LaserWriter LS will now ship with new printer drivers that enable background printing. The Personal LaserWriter LS’ new driver will also double that printer’s performance.

The new Apple Personal LaserWriter LS also provides approximately 30% more paper capacity (70 sheets); an optional 250-sheet paper tray is available in addition for customers with more demanding paper usage rates.

**TrueType fonts.** Both printers will ship with four additional TrueType™ font families — Chicago, Geneva, Monaco, and New York. TrueType fonts ensure that users will get smooth screen representation of text at any size. They join the current set of TrueType fonts, which includes Times, Courier, Helvetica, and Symbol. Each font is automatically installed in the user’s system during the normal printer installation procedure.

Greater performance and flexibility. These enhancements give Macintosh users more performance and flexibility in the same compact, easy to use printer designs for the same price. They are fully compatible with System 7 and with virtually all software applications.

Current owners can upgrade by obtaining copies of the installation disks at the Book Center or by downloading the information from Appleslink under the Apple products icon.

—from an Apple release

New WordPerfect Educational Resale Agreement with Book Store

Students and faculty who are purchasing WordPerfect products for their personal use may now do so at a special educational price of $135 per copy. This includes WordPerfect (both the IBM PC and Macintosh versions), DrawPerfect, and the soon-to-be-released WordPerfect for Windows.

Departmental purchases of WordPerfect can be made at a price of $270 (for the IBM version) and $285 (Macintosh version). For these prices, the department receives a site license for installation of the software on eight machines.

Check with the Book Store (998-4672) for comparably good prices on other WordPerfect products as well as on popular software from other major vendors.
Purchasing Services

Notes and News Bits from NYU’s Purchasing Services

NYU has implemented a Laser Toner Recharge program. Requests for recycled toner cartridges may be made by submitting a Stock Room Requisition to Central Supply. The price for a recycled toner cartridge is $42.50 each. NYU’s actual cost for a recycled cartridge is $37.50 each, but, to promote the recycling effort, Central Supply is selling the cartridges at $42.50 each and will refund (in the form of a rebate) the department $5.00 for each used cartridge returned. When ordering, please specify on the Stockroom Requisition the manufacturer and model of the printer the toner is for.

The following chart may be helpful in determining the type of cartridge you should order:

<table>
<thead>
<tr>
<th>Cartridge Type</th>
<th>Printer</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP-S</td>
<td>Hewlett Packard LaserJet Series II, IID, III, III; Apple LaserWriter IINT, IINTX, IISC, OMS PS810</td>
<td>$42.50</td>
</tr>
<tr>
<td>EP-L</td>
<td>Hewlett Packard LaserJet IIP, Apple Personal LaserWriter SC and NT</td>
<td>$42.50</td>
</tr>
<tr>
<td>EP series I</td>
<td>Hewlett Packard LaserJet; Apple LaserWriter and LaserWriter Plus</td>
<td>$42.50</td>
</tr>
</tbody>
</table>

When the new recycled laser toner cartridge is received from Central Supply, place the used laser toner cartridge and used felt wand in the laser toner packing box and return to Central Supply. By returning your used laser toner cartridge and laser wand your department will receive a $5.00 credit on your next Central Supply purchase.

The recycled toner cartridge is compatible with most laser printers built on the Canon EP-S series II & III(SX) engines. For compatibility information, please contact Central Supply at 998-1200.

Please note... The prices and maintenance arrangements mentioned in this section are for NYU institutional purchases only. For prices on individual purchases, you are encouraged to consult with the NYU Book Center.
New IBM PS/2 Models and Promotions

IBM has announced several new models of PS/2's and new promotional bundles. Prices include all shipping charges and a carry-in warranty of 1 year on all parts and labor. Other IBM promotional offerings are available. For pricing information, please contact NYU's Purchasing Services Division at 980-1030.

Current NYU prices on some IBM promotional products are as follows:

<table>
<thead>
<tr>
<th>IBM</th>
<th>Model#</th>
<th>EOC #</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8530-U42</td>
<td>2499218</td>
<td>$1699</td>
</tr>
<tr>
<td></td>
<td>8555-U41</td>
<td>2499219</td>
<td>$1999</td>
</tr>
<tr>
<td></td>
<td>8555-W81</td>
<td>2499221</td>
<td>$2599</td>
</tr>
<tr>
<td></td>
<td>8557-3T1</td>
<td>2499963</td>
<td>$3299</td>
</tr>
<tr>
<td></td>
<td>8557-3W1</td>
<td>2499964</td>
<td>$3349</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Processor Type</th>
<th>Processor Speed</th>
<th>System Memory</th>
<th>Bios</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80286-10</td>
<td>10 mhz</td>
<td>2MB RAM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>80386-xx</td>
<td>16 mhz</td>
<td>4MB RAM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>80386-xx</td>
<td>20 mhz</td>
<td>4MB RAM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>80386-xx</td>
<td>20 mhz</td>
<td>4MB RAM</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Disk Size</th>
<th>Hard Disk Size</th>
<th>5.25&quot; Drive</th>
<th>3.5&quot; Drive</th>
<th>Monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>45MB</td>
<td>NO</td>
<td>1.44mb</td>
<td>VGA 8513</td>
</tr>
<tr>
<td></td>
<td>45MB</td>
<td>NO</td>
<td>1.44mb</td>
<td>VGA 8513</td>
</tr>
<tr>
<td></td>
<td>80MB</td>
<td>NO</td>
<td>1.44mb</td>
<td>VGA 8513</td>
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<tr>
<td></td>
<td>80MB</td>
<td>NO</td>
<td>2.88mb</td>
<td>VGA 8513</td>
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<tr>
<td></td>
<td>80MB</td>
<td>NO</td>
<td>2.88mb</td>
<td>VGA 8513</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Software (preloaded)</th>
<th>DOS 5.0</th>
<th>Windows 3.0</th>
<th>Multimedia</th>
<th>Windows</th>
<th>Entertainment Pak</th>
<th>MS Word for Windows 1.1</th>
<th>Grammar</th>
<th>lDC MicroApps</th>
<th>MS Excel</th>
<th>ToolBook 1.5 (Runtime)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

Note: When placing your order through the Purchasing Department, we strongly recommend that you include the IBM extended warranty option. What this does is convert the IBM's customer carry-in repair to an on-site repair service (for CPU's and printers) or an on-site exchange service (for monitors). The cost is $40.00 for each CPU and $10.00 for each monitor listed above. When requesting this, please write it as follows:

#9805 CPU Warranty upgrade to on-site repair service $40.00
#9876 Monitor Warranty upgrade to on-site exchange service $10.00
#9805 IBM proprinter III Warranty upgrade to on-site repair service $11.00
#9805 IBM proprinter XL24E Warranty upgrade to on-site repair service $20.00
#9805 IBM proprinter XL24E Warranty upgrade to on-site repair service $30.00
#9805 IBM Laserprinter model E Warranty upgrade to on-site repair service $80.00

The Purchasing Department is arranging with IBM to store certain promotional packages in stock at Central Supply. Please contact the Purchasing Department for further information on the models carried and current availability.

Computer Expo at NYU

Purchasing Services will be sponsoring a show on Friday Nov. 1, 1991 from 11:00 am to 4:00 pm at 25 West 4th Street, basement. The latest product offerings and product demonstrations will be held in rooms C-13 through C-19. To get to the show you may either go down the staircase at 25 west 4th Street or take the elevators at 269 Mercer Street down to the basement.

Participants will include APPLE, DELL, DEC, IBM, Hewlett Packard, QMS, GA Computer, Westwood Computer, Computerland of Secaucus, Zenith Data Systems, and others. Representatives from each company will be present to answer any questions you may have about products or services.

In addition, this will give you the opportunity to meet with the vendors who supply NYU with most of its computer-related requirements.

NOTE: If your department is interested in having a piece of computer hardware or software demonstrated, please contact the Purchasing Department. Several NYU suppliers have suggested that they can provide demonstrations of some of their product lines. If there are enough interested parties a product demonstration can be arranged.

IBM Trade-in Program

IBM recently announced a special trade-in program for universities in which NYU may participate. The program is designed to offer end-users within the NYU community a special trade-in allowance on selected IBM, Apple, and Compaq computers.

The range of products covered includes selected IBM PCs, A Ts, XT's and PS/2 models, as well as selected Apple products including the MAC 512, 512KE, MAC PLUS, MAC SE, SE/20, and SE/30. The list of selected Compaq

(continued on page 31)
Technology in the Service of Humanities Research

Link to Beazley Archive Offers New Possibilities in Research and Instruction

While researching a book on the representation of priestesses in ancient Greek art, I was confronted with certain methodological problems stemming from the fact that the systems by which ancient images have been collected and categorized over the years could be consulted only one at a time.

Sir John Beazley’s extraordinary life work in recognizing the hands of individual vase-painters of ancient Greece laid the groundwork for the study of ancient images, organizing them according to artist and vase shape. Over the course of this century, connoisseurs have worked to identify the works of individual vase painters of ancient Greece and iconographers have worked to distinguish the costumes, attributes and actions by which the gods and goddesses, heroes and heroines of Greek myth might be recognized. This has resulted in any number of valuable reference collections, catalogues, lexica, and monographs, organized according to artists, vase shapes, and the iconographies of named divinities and mortals.

But how was I to gather the images of priestesses, or potential priestesses—the unnamed women shown participating in religious ritual? What of all those anonymous individuals that “fall between the cracks” of the traditional systems of categorization? What about ambiguous images of uncertain identity? How was I to collect them using systems structured around “identifiable” personalities?

**Asking New Questions**

I began to be acutely aware of the fact that the questions we ask in our research are often severely restricted by the ways in which the evidence has been collected and organized. New methods for approaching the study of ancient art, for viewing representations as part of a codified “language of images”, were frustrated by the inability to ask many questions simultaneously.

Then, in the summer of 1989, I was introduced to the Beazley Archive at the Ashmolean Museum, Oxford University. The online database allowed for all the traditional systems of organizing images to be pooled, cross-referenced, and cross-searched. This permitted the posing of new questions not possible with any one system.

For example, I could ask for a list of all vases showing sacrifice scenes. I could then ask for all sacrifice scenes involving women. I could ask for all scenes showing altars...altars and women...altars, women, libation bowls...altars, women, libation bowls and offering trays. In this way, I could...
study patterns in representation that would not have been published previously. I could also ask for all vases showing sacrifice scenes by a certain artist. I could ask for all wine jugs that carry sacrifice scenes in which wine jugs are depicted. Traditional and new methods of inquiry could be conducted simultaneously; technique, artist, shape, iconography and recurring patterns in the "codified systems" of imagery could be searched at the same time.

Returning to the Beazley Archive during the summer of 1990, supported by a National Endowment for the Humanities Travel to Collections grant, I continued my research on Greek priestesses. The resulting study has benefited enormously from this invaluable resource.

**NYU Course to Use Link to Beazley**

Does such an effective research tool have potential for the classroom, as well? It certainly does and, in fact, stands to revolutionize the ways in which ancient images can be grouped and interpreted within a single semester of study. Traditionally, students spend the majority of their time compiling data rather than interpreting it. Use of the Beazley Archive will allow students to benefit immediately from the extraordinary corpus of information gathered over the course of this century and to get on with the critical step of interpretation.

During the spring semester of 1991-92, twelve undergraduate students in Fine Arts will have the opportunity to take, as their Senior Seminar in Methods of Research, a special course on the Iconography of Greek Vase Painting, making use of the Beazley Archive Data Base. They will connect to and use the database in England via an NYU-NET link to an international network to which Oxford University's network is also connected. Utilizing both traditional and "new" methods of inquiry, these students will be able to experience first hand the ways in which the questions we ask affect the answers we reach.

—Joan Connelly
Department of Fine Arts (FAS)

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**A Rich Source of Information for Scholars**

The importance of the material computerized lies largely in the pictures painted on it. Unlike most pottery, which is undecorated or decorated with patterns or animals, these ancient Athenian vases have detailed pictures of men, women, and children, their heroes and their gods. The pictures tell us more about the life, religion, and mythology of ancient Greece than any other art preserved from antiquity.

For this reason, the data are useful to anyone with an interest in classical antiquity. The database fields (Artist, Attribution and Scholar (attributor), Catalogue Number, Collection, Iconography, Inscription, Join (of fragments of pottery), Publication, Reference and several specialized tables with multiple compatible PC's over the University's internal network.

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Athenian red-figure vase of the mid-5th century BC in the Ashmolean Museum. (Photograph courtesy of the Ashmolean Museum.)

(continued on following page)
fields) can be searched in any combination. Dates can be generated in overlapping twenty-five-year periods, indexes to publications and collections, and subjects in generic terms.

The database is a major research project of the Beazley Archive, which is owned by the University of Oxford and is housed in the University's Ashmolean Museum. Under the direction of the Archivist, Dr. Donna Kurtz, and the Lincoln Professor, Sir John Boardman, it is managed by two graduate students working full-time, Thomas Mannack and Melanie Mendonca. Like the graduate students who assist them on a part-time basis, they are engaged in doctorates in Greek archaeology. The database has benefited greatly from the financial support of the British Academy, Lincoln College (Oxford), and the J. Paul Getty Trust.

The Beazley Archive developed

from the personal archive of Sir John Beazley (Lincoln Professor of Classical Archaeology and Art, 1928-1956). On his death in 1970 it was installed in the Ashmolean Museum. Beazley's archive contained a large photographic collection (estimated in excess of 150,000 prints in 1970), notes and drawings. The great part of this material pertained to Athenian pottery, although most aspects of Greek art were well represented. There are, for example, in excess of 10,000 prints of Greek sculpture. Beazley's notes and drawings are a static collection but the photographs of Athenian pottery have been greatly augmented through gift and purchase. Today, the number of prints is estimated to exceed 250,000.

Soon, an Image Database

In 1992, the Archive expects to begin to incorporate about 100,000 of these photographs (most of them black and white) into the database probably using flat bed scanners and a software program which will permit enhancement of old or poor quality prints. It is likely that the INGRES files will need to be converted into a programme designed for data and image such as Fourth Dimension for the Apple Macintosh. Scanning this number of prints will take some time. The process was not begun earlier for several reasons: technology was changing rapidly, costs were falling and the international telecommunications networks available for academic research could not transmit data and image effectively.

To promote the application of information technology in classical art and archaeology internationally, the Beazley Archive is working with the European Commission and the European Science Foundation. Under the aegis of the latter it will host a conference in the spring of 1992. To promote American association with this project, representatives from the Perseus Project and the J. Paul Getty Museum will be invited to participate. To encourage the students and staff of NYU to use the Beazley Archive's database, Professor Connelly expects to invite members of staff to attend her seminar on Greek Vase-painting in April 1992.

The University of Oxford welcomes the association with NYU and hopes that it will help to demonstrate to the international community of scholars how information technology can be made to serve the Humanities.
New ACF Service To Focus on Arts and Media at NYU

A new ACF service will focus on providing support for the application of computer-based technologies to the Arts and Media.

The service will begin this semester and will include help with such technology applications as three-dimensional and two-dimensional computer animation; the editing of and interaction with traditional and digital video; sound design and music composition, synthesis, and production; image processing for photography and prepress; paint and three-dimensional modeling systems for fine arts applications; the modeling of set and lighting design for theater, dance and other performance spaces; as well as the modeling of museum space and lighting design.

The ACF will be actively seeking out existing activities and helping to create new ones. The plan is to do this by pursuing three types of activities, or paths, simultaneously.

**Direct Support to Faculty**

On the first path, ACF staff will be working directly with faculty from Arts—related departments, with the goal of integrating new technologies into their curricula, studio environments, and creative activities.

Here, the ACF's role will, in part, be technical. It may include anything from answering a simple question to providing in-depth instruction of faculty, or from giving a quick demo to creating a complex prototype or example. Technical support may also include consulting on the design of a computer-based production facility. The ACF will also provide some types of non-technical support — for example, in the case of a departmental or cross-disciplinary initiative requiring the preparation of grant proposals or the nurturing of special vendor relationships.

**Equipment for Faculty and Students**

On the second path, the ACF plans to provide public facilities equipped with the hardware, software, and consulting support needed by NYU faculty and students for Arts and Media applications.

As a first step in this direction, the ACF will be installing at its Education Building computer lab (see pages 16-17) a number of high-end Macintosh systems, many of which will include hardware peripherals for color image scanning, video frame grabbing, video recording, sound manipulation, and interactive video. Software will be included to support 32-bit color paint, image processing, and animation.

Equipment in the ACF's Visualization Center will also be augmented with facilities for high resolution image scanning from 35 mm film, and improved hardware support for single-frame video layoff of both scientific visualizations and creative animations. The Visualization Center, located on the third floor of Warren Weaver Hall, will continue to offer the high-end equipment and support for scientific visualization that it has come to provide, as a result of the planning and efforts of ACF staff member Ed Friedman.

**Access to New Products, Vendor Support**

The third path will be to work with vendors and other technology providers, to gain early and leveraged access to new products for artists and other media producers at the University. Often this kind of activity can result in "beta" test participation, in the seeding of new hardware and software, or in outright grants.

—Philip Galanter
(galanter@nyu.edu)

New ACF Staff Member To Focus on Arts/Media Support

Philip Galanter joined the ACF staff in mid-July with the primary objective of providing support for applications of computer-based technologies to the Arts and Media. Mr. Galanter comes to NYU from Northwestern University, where he managed the Advanced Technology Group (ATG) within the academic computing organization.

Among its activities, the ATG instituted a Computer Media Studio in support of creative applications similar to those described in the accompanying article. (Presentations at NYU last spring by Mr. Galanter and his ATG colleague Gary Greenberg are reported on page 9.)

Previously, Mr. Galanter headed a project at Northwestern under which the statistical package, SPSS, was converted for use on Control Data Corporation computers for distribution worldwide. Active in computer graphics and electronic music since the early 1970's, Mr. Galanter has also created commercial MIDI music software in use around the world.

Philip Galanter can be reached at 998-3041 or by E-mail (galanter@nyu.edu). He notes, "I look forward to working closely with those in the various creative fields at NYU. If I haven't found you yet, feel free to call or visit and introduce yourself!"
Graphics and Printing

New Version of AVS Available

Powerful Tool for Scientific Visualization is Updated

Version 3.0 of AVS (Applications Visualization System) from Stardent Computer Inc. has been installed on the upgraded Stardent GS2500 minisupercomputer located at the ACF Visualization Center, Room 317 Warren Weaver Hall.

AVS is also available on two other minisupercomputers located in the Chemistry and Mathematics departments. The ACF will be acquiring additional one-year trial licenses from Stardent for the use of AVS on SUN, Silicon Graphics, Hewlett Packard and IBM RS/6000 systems.

A Powerful Tool

AVS is a powerful and relatively easy-to-use scientific visualization tool for displaying and manipulating high-resolution color graphics and images. It uses a point-and-click interface similar to those routinely found on high-end microcomputers.

The software can be used to display XY and contour graphs of data; 24-bit color pixel map images; color-shaded surfaces of complex geometric objects, such as molecular structures or field data; and volumetric data, such as MRI or CAT scans. The data can be generated from a program running on the system where AVS is resident, or they can be imported from local or remote computing or data collection systems.

Several existing AVS subsystems called viewers permit easy display of data and objects. AVS comes with a facility called the Network Editor that permits the user to build his or her own applications using pre-existing modules in an elegant manner called "visual programming". Additional modules can be written and easily integrated into AVS.

Hardcopy and Video

Snapshots of scenes on the color display of the Stardent can be captured as monochrome or color PostScript files and printed. Eventually, it will be possible to capture sequences of images and store them on video devices to create animations of the phenomena being studied.

Several researchers and graduate students in Mathematics, Biology and Chemistry, and the Tisch School of the Arts, have employed AVS both for viewing images and for producing hard-copy of them.

Upcoming ACF tutorials will provide more information and training in the use of AVS as well as other visualization and graphics tools.

To learn more about the facilities of the ACF Visualization Center, contact Ed Friedman at 998-3051.

—Ed Friedman
friedman@acfcluster.nyu.edu

New Color Scanner and Printer at the Visualization Center

Two new color graphics devices, a printer and a scanner, have been added to the resources of the ACF Visualization Center in Room 317 Warren Weaver Hall.

A New Printer

The new Hewlett-Packard PaintWriter XL is a color inkjet printer with a graphics resolution of 180 x 180 dots per inch. The printer has eight standard colors and up to 16.7 million shades and hues, and will produce a color graphics print or transparency in less than 3 minutes. The print speed for text ranges between 167 and 200 characters per minute.

The command language, Color QuickDraw, is easily accessible from many Macintosh applications, such as Freedom of the Press, for color PostScript files and directly through numerous paint packages, as well. The device is networked so that images can be sent for printing from remote computers.

And A Color Scanner

The new scanner is an Epson ES-300C flatbed image device connected to the SCSI port on a Macintosh Ilex. The published characteristics are full-color and gray-scale monochrome scanning; up to 256 gradation tones per pixel; nineteen scanning resolutions, from 50 to 600 dots-per-inch; a zoom function to reduce or enlarge the image size from 50 to 200 percent; and a direct print function that lets you use the scanner as a simple color copier. It has a maximum scanning area of 8.5 by 11.7 inches.

Software supplied with the scanner are Image Studio and Color Studio from Letraset, but the scanned images can also be used with other software packages.

—Ed Friedman
friedman@acfcluster.nyu.edu

About the ACF's Visualization Center...
The computer graphics equipment in the ACF's Visualization Center (Room 317, Warren Weaver Hall) is available on request to faculty members, research staff and advanced students.

For further information on the ACF's Visualization Center, contact Ed Friedman (friedman@acfcluster.nyu.edu or 998-3051).
Photo-Typesetting Soon to be Available from the ACF

A New Varityper Produces Publication-Quality Camera-Ready Text and Graphics

In cooperation with NYU's Public Affairs Department, the ACF will soon be making available a new photo-typesetting system. As we go to press, the new system, a Varityper 4000, is being installed and tested, and is being readied for use on site at the ACF and as a network-accessible service.

The Varityper 4000

The new Varityper 4000 is a state-of-the-art, PostScript-based electronic typesetting system. It can produce output on either film or photographic paper at resolutions of up to 2400 dpi (dots-per-inch). For purposes of comparison, most popular laser printers, such as Hewlett-Packard LaserJets, Apple LaserWriters, and QMS Imagens, print at 300 dpi.

The Varityper can produce text and graphics output of a quality that is truly camera-ready, and has, in addition, superior "halftoning" capabilities. ("Halftoning" is a technique for reproducing photographs and other continuous tone images.) With the Varityper, it will also now be possible to produce four-color "separations", for submission of camera-ready copy in which full-color illustrations are used.

A Convenient and Economical Final Copy Device

The Varityper is expected to be a boon to faculty and staff who are preparing manuscripts for publication. Increasingly, publishers of academic journals and texts are accepting camera-ready copy. This often results in lower production costs and less time spent in the editing cycle.

It is expected that the Varityper will be used as a final copy device. Since the machine uses the popular page-description language, PostScript, users will be able to produce page-proof copies on lower-quality laser printers and then submit the final copy for printing on the Varityper. PostScript-supporting laser printers with resolutions of 300 dpi are now fairly common on campus. In addition to the ACF's 300 dpi laser printers, there are also a growing number of departmental and personal printers suitable for the printing of draft copies. The LaserJet, LaserWriter and Imagen printers all support PostScript.

The wide-spread availability of devices for printing page-proofs, along with the increasing network connectivity in departmental offices around the NYU campus, will make it both convenient and economical for faculty and staff to use the Varityper to produce camera-ready copy. While, as we go to press, details of the ACF's new photo-typesetting service are still being resolved, it is expected that overnight service will be provided. A minimal per-page rate may be charged to cover costs of media (film or special paper).

For further information...

We plan to tell you more about the Varityper 4000 and the ACF's new photo-typesetting service in the next issue of this newsletter. Should you need further information before then, please contact John Kesich at the ACF (E-mail: kesich@nyu.edu; phone: 998-3047).---John Kesich (kesich@nyu.edu) with Estelle Hochberg (hochberg@acfcluster.nyu.edu)

Two trefoil knot structures revealed from a molecular dynamics simulation of supercoiled DNA. Result is part of a study on supercoiled DNA energetics and dynamics by Tamar Schlick (Math, CIMS and Chemistry, FAS), in collaboration with Wilma Olson of Rutgers University. Computations were done on the ACF cluster and remotely on a Cray at the San Diego Supercomputer Center. Rendered by Ed Friedman using AVS' Geometry Viewer on the Stellar minicomputer, and produced in hardcopy on the Tektronix color printer in the ACF's Visualization Center. A full animated sequence of the knotting event was prepared on the ACF Visualization Center's IRIS workstation.

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New Versions of Movie.BYU Available from the ACF

Versions of Movie.BYU for Silicon Graphics Workstations and for X-Windows are now available from the Academic Computing Facility. Please contact Ed Friedman at 998-3051 (friedman@acfcluster.nyu.edu) to obtain copies.

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Academic Computing and Networking at NYU, September 1991, page 29
Focus on CMLIB

CMLIB is the National Institute of Standards and Technology's (formerly National Bureau of Standards') Core Math Library. It is a collection of non-proprietary, easily transportable, FORTRAN subprogram packages used to solve a variety of mathematical and statistical problems.

The library is available on the ACF Cluster, ACF3, ACF9, ACF14, ACF15, and the Convex (ACF10).

On the VAX/VMS system, detailed information can be obtained by typing "HELP CMLIB". The Help utility gives a brief description of each of the subroutines and documentation. It also tells how to link the library to a program calling any of the subroutines. On the ACF cluster, HELP MATH lists all of the mathematical packages available.

On the ACF UNIX machines the command "man cmlib" gives detailed instructions on the use of the package. "cmdoc -s" gives a brief summary of the subprograms, and cmsrc and cmsrcx are used to obtain the FORTRAN source for the routines desired and all associated routines.

CMLIB contains programs for evaluating one and two-dimensional integrals; evaluating special functions of statistics; basic linear algebra subroutines; solving linear least square problems; spline computation; solving linear two-point boundary problems; solving initial value problems for systems of ordinary differential equations; cluster analysis; obtaining zeroes of polynomials and functions of one variable; sorting; computing Fast Fourier Transforms; solving systems of linear algebraic and differential equations; evaluating machine constants; regression analysis; interpolation of univariate data; random number generation; linear programming problems; constrained minimization problems; and solving three-dimensional Helmholtz equations on a staggered grid. It also contains a sparse matrix package, EISPACK, LINPACK, and FISHPACK.

It is a comprehensive library which can be helpful to researchers and students in all fields.

—Frances Bauer
bauer@acfcluster.nyu.edu

Some results of Shortest Path Algorithm with Low Metrication Error, a simulation study by Dr. Yakov Smoritsky running on ACF3. Displayed and printed (respectively) on the IRIS color graphics workstation and the Howtek color printer in the ACF's Visualization Center. Graphical front end for this algorithm implemented by Victor Kremer. Dr. Smoritsky's work is targeted toward developing methods of selecting environmentally acceptable routes for oil and gas pipelines. (See pages 28-29 for more on the Visualization Center.)
New Naming Conventions for WYLBUR Data Sets

Important Update for Users of the IBM Mainframe's WYLBUR System

By the end of 1991, the IBM mainframe batch operating system will be upgraded from MVS/SP to MVS/ESA, and a new version of the RACF file-security package will be installed. To improve the efficiency of file access, a change in the file-naming convention has been made. As of June 24, 1991, data set names on WYLBUR were changed from the older format of "WYL.GG.UUU.filename" to "GGUUU.filename". If your programs' JCL statements reference data set names, they must be modified to reflect this new naming convention. Programs in which the old data set name is used will fail to execute.

Help in Updating Your Files

ACF User Services has made available an EXEC file, FIXWYL, to help you update the files in your account. It will modify a set of files, changing "WYL.GG.UUU" to "GGUUU", and will then resave the files. You will be prompted to approve each change. You may choose to convert all files in your directory and/or catalogue, or a specific list of files. There is no need to run FIXWYL on data files or system files. Only files containing JCL (those lines starting with '//') or EXEC files need be processed.

It is each user's responsibility to update his or her own files to reflect the new data set naming conventions.

Note that the Data Base Archive files should still be referred to in your JCL as "WYL.PB.DBA.filename". (The DBA contains files on tape, not on disk, and naming conventions for tape files have not been changed as yet.) FIXWYL will take this exception into account.

Using FIXWYL

In order to invoke FIXWYL, type the following command:

```bash
X FRO $PB$OB$EXEC$FIXWYL
```

FIXWYL will begin by providing the user with instructions of which a printed copy can be obtained.

Remember to:

- Change "WYL.GG.UUU" to "GGUUU"
- Important exception: "WYL.PB.DBA"
- Update all your JCL and EXEC files
- Call 998-3434 if you have questions

FixWYL converts one file at a time. Therefore, if you have many program files in your account, it may take a while to convert them all. You may interrupt FIXWYL at anytime. The next time FIXWYL is executed, it will continue from where it left off.

For help, contact the ACF consultants in Room LC-7 Tisch Hall (998-3434).

---Lisa Barnett
(barnett@acf.nyu.edu),
John Kesich (kesich@acf4.nyu.edu),
Ivor Smith (smith@acf.nyu.edu)

(Purchasing Services, continued from page 23)

Recycling Used NYU Computer Equipment

If you have hardware or software that your department no longer uses or if you plan to upgrade and you would like to find a home for the equipment no longer needed, please let the Purchasing Department know. The results of this inquiry will be published in the next issue of this newsletter.

The value of each product is normally decided upon by the departments or persons interested in the disposition or acquisition of it. The Purchasing Department is only putting those who wish to barter in touch with each other. This arrangement, however, does not apply to personal acquisitions.

If the equipment is tagged by the Property Management office, arrangements must be made by the departments involved in the transaction to inform Property Management in writing that the equipment has been relocated. Please contact Stephen Krause with product information. He can be reached by E-mail (krause@acfcluster.nyu.edu) or phone (X-81032).

---Stephen Krause
Senior Buyer
NYU Purchasing Services Division
Computing for the Social Sciences

Sponsored by the Social Science Computing Association, in cooperation with the Bureau of the Census and the Oak Ridge National Laboratory, the 1992 Conference on Computing for the Social Sciences will take place on May 4-7 (Monday through Thursday), at the University of Michigan in Ann Arbor.

The conference theme — Gateways to the Future — focuses on the revolutionary capabilities for the management and analysis of social, economic, political, and demographic data brought about by the technological changes of recent years. The conference will offer a forum for an expected 300 participants on the computing power, mass data storage, electronic networks, graphics systems, and applications made possible by this new technology.

The programs five major tracks will be: data acquisition, management, and distribution; research strategies and analytic methods; graphics and visualization; infrastructure; and networks.

Abstracts of papers for possible presentation are invited. Please send a FAX or E-mail message by December 1, 1991 to the Program Chairman with the following information: your name, job title, organization name, address, phone, Fax, E-mail address, preferred track, and an abstract and outline of your paper in 300-500 words. Full text of selected papers must be received by April 1, 1992.

The conference registration fee will be $200. Registration, accommodation, and travel fees will be the responsibility of each presenter. To receive registration material in January, please send your name and address by E-mail to: css92@um.cc.umich.edu (Internet).

Questions or suggestions about the program can be addressed to Al Anderson, Program Chairman, University of Michigan: 313-998-7140 or by E-mail albert_f_anderson@um.cc.umich.edu.

EDUCOM '91: Curricula, Computing and Culture

EDUCOM '91 will be taking place on October 16-19, 1991 in San Diego, California, where it will be hosted by the University of California at San Diego. The theme will be Curricula, Computing and Culture.

EDUCOM is a nonprofit consortium of over 600 colleges, universities and other institutions, founded to facilitate the introduction, use and management of information technology in higher education. Its annual conference is the principal such event for professionals who are planning the future of information technology in higher education. It brings together leaders in information technology in higher education and is an opportunity for attendees to share the knowledge and experience of experts and specialists, and to learn of developments, breakthroughs and innovations that are reshaping higher education.

The schedule of pre-conference events, conference sessions, software fair, SIG meetings and other special events, is available at the ACF (Room 306 Warren Weaver Hall, 998-3036) or contact EDUCOM at 212-872-4200 or conf@educom.edu.

Upcoming Meetings

EDUCOM '91: Curricula, Computing and Culture

EDUCOM '91 will be taking place on October 16-19, 1991 in San Diego, California, where it will be hosted by the University of California at San Diego. The theme will be Curricula, Computing and Culture.

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Additional Events

- September 30-October 2, SUP'EUR, Rome, Italy. Sponsor: University of Rome. Contact: SUP'EUR Fall '91, Palazzo Specchi, Via degli Specchi n.3, 00186 Roma, Italy. Tel. 06/683776-6548352. Fax 06/6873091
- October 7-11, INTEROP 91, The 6th Interoperability Conference and Exhibition, San Jose, CA. Contact 1-800-INTEROP, ext 2502; Fax 415-949-1779.
- October 15-16, EDUCOM Educational Uses of Information Technology (EUIT) Preconference Working Session, San Diego, CA. Contact: 202-872-4200; EUIT@EDUCOM.EDU
- October 22-25, Visualization '91, San Diego, CA. Contact: NIELSON@ENUXVA.EAS.ASU.EDU
- November 3-6, ACM-SIGUCCS User Services Conference XIX, Seattle, WA. Sponsor: SIGUCCS. Contact: Sheryl Burgstahler, University of Washington, HG-45, Seattle, WA 98195; 206-543-0622; SHERLYB@CAC.WASHINGTON.EDU
- November 18-22, Supercomputing '91, Albuquerque Convention Center, Albuquerque, NM. Sponsor: SIGARCH and IEEECS. Contact: Raymond Elliott, Computing Division, Los Alamos National Lab, P.O. Box 663, MS B260, Los Alamos, NM 87543; 505-667-1449; RLE@LANL.GOV
- December 2-5, An Integrated Perspective of Computers and Communication Systems, Singapore. Contact: ESUBRAM@NTIVAX.BITNET
- December 15-18, Hypertext '91, San Antonio, TX. Contact: HT91@BUSH.TAMU.EDU
**Fall '91 at the ACF**

### Important Dates for ACF Users

#### September

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>Individual computer account renewal applications are being accepted for fiscal year 1991/92.</td>
</tr>
<tr>
<td>Current - Sept. 4</td>
<td>Instructors apply for Fall 1991 computer accounts for their classes (Class Accounts) as early as possible.</td>
</tr>
<tr>
<td>Aug. 31 - Sept. 2*</td>
<td>(Sat., Sun., Mon.) Labor Day weekend all sites closed</td>
</tr>
<tr>
<td>Sept. 4</td>
<td>(Wed.) Students register for computer use for fall semester, starting today.</td>
</tr>
<tr>
<td>Sept. 4</td>
<td>(Wed.) ACF's summer hours end; regular fall hours resume. see inside back cover</td>
</tr>
<tr>
<td>Sept. 4</td>
<td>(Wed.) Fall semester begins.</td>
</tr>
<tr>
<td>Sept. 9</td>
<td>(Mon.) Rosh Hashanah regular hours**</td>
</tr>
<tr>
<td>Sept. 18</td>
<td>(Wed.) Yom Kippur regular hours</td>
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</tbody>
</table>

#### October

<table>
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<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Oct. 14</td>
<td>(Mon.) Columbus Day (observed) regular hours</td>
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</table>

#### November

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<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Nov. 5</td>
<td>(Tues.) Election Day regular hours</td>
</tr>
<tr>
<td>Nov. 11</td>
<td>(Mon.) Veterans' Day regular hours</td>
</tr>
<tr>
<td>Nov. 28*, Dec. 1</td>
<td>(Thurs., Sun.) Thanksgiving Day and Thanksgiving Sunday all sites closed</td>
</tr>
<tr>
<td>Nov. 29*, 30</td>
<td>(Fri., Sat.) Thanksgiving Friday and Saturday holiday hours**</td>
</tr>
</tbody>
</table>

#### December

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>Dec. 9 - Jan. 21</td>
<td>Instructors apply for Spring 1992 computer accounts for their classes.</td>
</tr>
<tr>
<td>Dec. 9 - 19</td>
<td>Students who expect Incompletes in fall semester courses should apply for computer account extensions. (Instructor's signature required.)</td>
</tr>
<tr>
<td>Dec. 11 - 20</td>
<td>Students with fall semester Class Accounts should archive all files they wish to keep after Dec. 20.</td>
</tr>
<tr>
<td>Dec. 13 - 20</td>
<td>(Fri. - Fri.) Final examinations week regular hours, plus Sunday§</td>
</tr>
<tr>
<td>Dec. 20</td>
<td>(Thurs.) Student Class Accounts issued for the fall semester expire.</td>
</tr>
<tr>
<td>Dec. 24 - Jan. 1*</td>
<td>(Tues. - Wed.) Christmas - New Year's Recess see note below†</td>
</tr>
<tr>
<td>Dec. 21 - Jan. 21</td>
<td>Winter Recess see note below†</td>
</tr>
</tbody>
</table>

#### January

<table>
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<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>Jan. 2</td>
<td>(Thurs.) ACF Offices reopen after Christmas - New Year's Recess regular hours</td>
</tr>
<tr>
<td>Jan. 20*</td>
<td>(Mon.) Dr. Martin Luther King, Jr. Day see note below†</td>
</tr>
<tr>
<td>Jan. 22</td>
<td>(Wed.) Spring semester begins. Instructors, please apply for Spring 1992 Class Accounts, if you have not already done so regular hours</td>
</tr>
</tbody>
</table>

*University holiday

**See inside back cover for the ACF's regular and holiday hours.

§Toward the end of each semester, the ACF opens one or two additional sites on Sundays to help students with their end-of-term preparations. Hours and locations to be announced.

†ACF offices in Warren Weaver Hall will be closed for the Christmas-New Year's recess (Dec. 24 - Jan.1) and for Martin Luther King, Jr. Day (Jan. 20). As we go to press, however, hours at the ACF's user work areas during the University's Winter Recess (Dec. 21 - Jan. 21) have not as yet been put into final form. Hours will be announced via our online news, notes, and bulletin board facilities, and will be posted at ACF sites.
New computer users at NYU are welcome to take part in the ACF's introductory-level "walk-in" tutorials. Reservations are not required. Simply arrive a few minutes early at the site where the tutorial is being given.

There is no charge, but participants should have a current, valid NYU I.D. In addition, some VMS, UNIX and IBM mainframe tutorials require a computer account.

Faculty may also arrange tutorials specially for their classes or research groups. In some instances, it may be possible to arrange for training to take place at a location selected by the requesting instructor or department. For IBM WYLBUR or VM/CMS, call Ivor Smith (998-3434); for all other systems, Frank LoPresti (998-3398). All tutorials are about one hour long.

**MS-DOS (IBM PC)**
Education Building, second floor

**Introduction**

**Wednesdays**
Sept. 11, Oct. 9
Nov. 13, Dec. 11
3:00 pm

**Intermediate**

**Wednesdays**
Sept. 18, Oct. 16
Nov. 20, Dec. 18
3:00 pm

**WordPerfect (IBM PC)**
Third Ave. No. Res. Hall, basement
Sept. 10 through Dec. 17

**Tuesdays**
5:30 pm

**Microsoft Works (PC, Mac)**
Third Ave. No. Res. Hall, basement
Sept. 4 through Dec. 18

**Wednesdays**
5:30 pm

**SPSS/PC+ (IBM PC)**
Education Building, second floor

**Thursdays**
Sept. 12, Oct. 10,
Nov. 14, Dec. 12
6:00 pm

**Karel * (Mac)**
Offered at the request of the Computer Science Department (FAS) for students in A22.002. (Students must bring a double-sided, double-density 3 1/2 inch diskette.)

14 Washington Place, basement:

**Mondays**
Sept. 9, 16, 23, 30
10:00 am, 4:30 pm

**Tuesdays**
Sept. 10, 17, 24
11:00 am, 3:00 pm

**Wednesdays**
Sept. 4, 11, 18, 25
10:00 am, 4:30 pm

**Thursdays**
Sept. 5, 12, 19, 26
11:00 am, 3:00 pm

**Fridays**
Sept. 6, 13, 20, 27
10:00 am, 4:30 pm

**Saturdays**
Sept. 7, 14, 21, 28
11:00 am, 2:00 pm

**StatView* (Mac)**
For students in the Masters of Social Work program, given at the department's request. Times to be announced. Please call Frank LoPresti at 998-3398 for further information.

**14 Washington Place, basement:**

**Mondays through Saturdays**
2:00 pm

Each Karel tutorial is limited to ten students. For more information, please call Howard Fink at 998-3500.

**Microsoft Works* (Mac)**
Offered at the request of the Computer Science Department (FAS) for students in A22.002.

14 Washington Place, basement
Sept. 4 through Sept. 30

**Mondays**
2:00 pm

**Tues., Thurs., Sat.**
4:30 pm

* Tutorials marked with an asterisk (*) are offered at the request of departments and instructors for students in particular courses or programs. Instructors who would like to arrange tutorials tailored specifically to their classes' needs are invited to contact ACF staff members Ivor Smith (998-3434) for the IBM mainframe, or Frank LoPresti (998-3398) for all other systems.
Important note: During the first three weeks of September, tutorials scheduled for the 14 Washington Place microcomputer lab will be held instead at the ACF's Tisch Hall lab (Room LC-8), while renovation of the 14 Washington Place site is completed.

UNIX (VAX and SUN)†
Third Ave. No. Res. Hall, basement
Sept. 5 through Dec. 19
Mondays
2:30 pm
Thursdays
6:30 pm
Saturdays
3:00 pm

VMS (VAX)†
Third Ave. No. Res. Hall, basement
Sept. 7 through Dec. 17
Mondays
6:30 pm
Tuesdays
11:30 am
Saturdays
1:00 pm

Electronic Mail†
(Using electronic mail at NYU. Two types of tutorials are given, reflecting two types of microcomputers from which E-mail might be accessed at NYU.)

From an IBM/PC
Education Building, second floor

Wednesdays
Sept. 18, Oct. 16,
Nov. 20, Dec. 18
1:00 pm

From an Apple Macintosh
14 Washington Place, basement

Wednesdays
Sept. 11, Oct. 9,
Nov. 13, Dec. 11
2:30 pm

WYLBUR (IBM mainframe)†
Room LC-8, Tisch Hall
Mondays
Sept. 9, 16, 23, 30
5:30 & 6:30 pm
Thursdays
Sept. 12, 19, 26, Oct. 3
5:30 & 6:30 pm

Introductory Lectures
Room 102, Warren Weaver Hall
Fridays
Sept. 13, 20, 27
6:00 pm
Note: Participants should have Academic WYLBUR accounts.

VM/CMS (IBM mainframe)†

Upon request, by appointment;
call Ivor Smith at 998-3434.

Analyzer* (Mac) New!
For students in V63.0021.15, at the request of the Mathematics Department (FAS).

Third Ave. No. Res. Hall, basement
Monday
Sept. 9, 16, 23
11:00 am
Wednesday
Sept. 11, 18, 25
1:00 pm
Friday
Sept. 13, 20, 27
3:00 pm

Micros to Mainframes New!
(Connecting to VMS and UNIX computers at NYU from the ACF's PC's and Macintoshes. Recommended as a first tutorial for new users of electronic mail or of the UNIX and VMS (ACFcluster) computers at NYU. Introductory-level treatment of uploading from micro to mainframe, downloading, and other topics in working on mainframes from a micro.)

For Macintosh users
14 Washington Place, basement
Sept. 7 through Dec. 17

Tuesdays
5:30 pm
Saturdays
2:30 pm

For IBM/PC users
Education Building, second floor
Sept. 9 through Dec. 17
Mondays
5:30 pm
Saturdays
1:00 pm

† Participants in UNIX, VMS, Electronic Mail, WYLBUR and VM/CMS tutorials should have an account on the appropriate ACF computer.
ACF Microcomputer Workshops

The ACF's non-credit, hands-on, half-day workshops in personal computing are open to NYU faculty, staff, and students—both graduate and undergraduate. Registration is required, but there is no fee for the microcomputer workshops. To register, during the week of the workshop please call Henry Mullish (998-3039) for IBM PC workshops, or Howard Fink (998-3500) for Macintosh workshops.

In order to accommodate as many registrants as possible, it may be necessary to share computers.

For IBM PC Users

At the ACF's Education Building site, 35 West Fourth Street, second floor. Morning workshops run from 9 a.m. to 12 noon, afternoon workshops, from 1 p.m. to 4 p.m.

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For Macintosh Users

At the ACF's Tisch Hall site through the third week of September; at the 14 Washington Place lab thereafter. Morning workshops from 9 a.m. to 11:30 a.m., afternoon workshops from 1 to 3:30 p.m.

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ACF Talks & Seminars*

For Instructors Using VMS at NYU

Education Building, second floor, 2:30 pm
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 work spaces can also be set up, if desired, either for the entire class or for subgroups within the class.

In this talk, Stephen Tibor will present the information needed to benefit from these very useful instructional aids.

For Instructors Using VMS
Tuesday, September 17

Topics in UNIX

Education Building, second floor, 2:30 pm
This two-part "mini-course" on the use of the UNIX systems at NYU will be given by Gary Rosenblum. It is an introductory-level follow-up to the ACF's introductory UNIX tutorials.

Topics in UNIX (part I)
Tuesday, September 24

Topics in UNIX (part II)
Tuesday, October 1

Macintosh System 7 and MS-DOS 5.0: Major Upgrades

Education Building, second floor, 2:30 pm
Gary Chapman of the ACF Faculty Microcomputer Laboratory will provide an overview of these major new operating system upgrades for Macintoshes and IBM PC's. What is different? What is new? Should you upgrade? Can you upgrade? How do you upgrade?

Mac System 7 and DOS 5
Tuesday, October 8

Supercomputer Access at NYU

Warren Weaver Hall, Room 1303, 2:30 pm
A discussion by Ed Friedman and Jeffrey Barry of supercomputer resources available to researchers at NYU—both at NYU (like the CONVEX, Stardent, and Astronautics) and at National Science Foundation-funded supercomputer facilities such as the Cornell Theory Center, the Pittsburgh Supercomputing Center, the National Center for Supercomputing Applications, the San Diego Supercomputer Center, and the National Center for Atmospheric Research.

Topics will include how to choose and apply for resources at these NSF-funded supercomputer labs, and how to gain access to their facilities from NYU. A packet of application forms and instructions will be available to those attendees who are interested in using NSF-supported supercomputer facilities.

Supercomputer Access at NYU
Tuesday, October 15

Topics in VMS

Education Building, second floor, 2:30 pm
This intermediate-level, three-part "mini-course" given by Stephen Tibor, will be of interest to users of the VAX/VMS systems at NYU. (Attendees are expected to have taken an ACF introductory tutorial in VMS. Please see page 35 for hours and location.)

In the first session, topics will include a review of the following: system messages that you receive when logging in (such as password expiration and choice, last login, scheduled down time, incomplete startup, stopped queues, closed sites, and announcements of interest); BBoard, COMMENT, E-Mail, other BBoards, and NEWS; directory trees, class accounts, the scratch disks and the loan disk; structure of the cluster and shared devices; and file names and types.

In the second session, topics will include batch and print queues; subprocesses; disconnected processes; user/supervisor/exec/kernel modes, subdirectories, and NFS file systems; deleting directories, ARCHIVE, REMOVE; magnetic tapes; and TELNET, FTP, and BITnet SEND.

The final session of this mini-series will cover compiling, SET HOST/LOG, and advanced topics of interest.

Topics in VMS (part I)
Tuesday, October 15

Topics in VMS (part II)
Tuesday, October 22

Topics in VMS (part III)
Tuesday, October 29

(continued on following page)

* All are welcome. Unless otherwise indicated, speakers are ACF staff members, and reservations are not required.

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Graphics Visualization
Available at the ACF
Warren Weaver Hall, Room 1303, 2:30 pm
Ed Friedman will discuss scientific graphics and visualization resources available at the ACF.

Visualization
Tuesday, November 5

Document Preparation
with LATEX
Education Building, second floor, 10:00 am
Given by Jae Fried. TEX is a program designed to produce high-quality typeset documents. LATEX adds to TEX a collection of commands that simplify typesetting by letting the user concentrate on the structure of the text rather than on formatting commands.

The first meeting will cover the typesetting of mathematical and non-mathematical documents using LATEX, with emphasis on macros, dealing with errors and navigating through the LATEX book. In the second meeting, topics suggested by those present at the first meeting will be discussed.

LATEX (part I)
Wednesday, November 6
LATEX (part II)
Wednesday, November 13

Network Services
Available at NYU
Education Building, second floor, 2:30 pm
NYU’s campus-wide network, NYU-NET, provides access to a growing array of online and network services, both within NYU and at institutions worldwide. This four-part series will focus on some of these services.

I. Internet Services
Jeffrey Bary will discuss several procedures by which individuals using computers at NYU can connect to other computers and services on the Internet, an international network connecting over 350,000 computers in the United States and abroad. Topics will include file transfers and issues in connectivity.

II. 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. In this session, members of the Bobst Library staff and ACF staff-member Jeffrey Bary will tell you 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.

III. BITNET and BITNET Services
BITNET is an international network of over 2000 computers at universities and research centers.

In this talk, Jeffrey Bary will demonstrate many of the features of the BITNET. Topics will include BITNET “file servers” and “listservers”, file transfers, connectivity and electronic mail, relays, electronic magazines, and online “White Pages”.

IV. Communicating Around the NYU Network: Kermit, Telnet, ProComm 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, ACF staff member, Larry Mingione, will talk about four communications software packages that are commonly used at NYU. He will discuss which of these should be used in the several different sorts of connections that are possible when communicating via NYU-NET. Such issues as file transfer and terminal emulation will also be addressed.

Internet Services
Tuesday, November 12

Internet Library Services
Tuesday, November 19

BITNET Services
Tuesday, December 3

Communicating Around NYU-NET
Tuesday, December 10
Diagnosing and Repairing
Macintoshes
Education Building, second floor, 2:30 pm
ACF staff members will discuss and
demonstrate trouble-shooting techniques and
other strategies for dealing with
problems that one might encounter while
using one’s Macintosh.
This talk is geared toward owners of
Apple Macintoshes in the NYU academic
community. (Please see December 17
for a comparable presentation for owners
of IBM PC’s.)

Repairing Macs
Tuesday, November 26

Diagnosing and Repairing
IBM PC’s
Education Building, second floor, 2:30 pm
ACF staff members will discuss and
demonstrate trouble-shooting techniques and
other strategies for dealing with
problems that one might encounter while
using one’s PC.
This talk is geared toward owners of
IBM-type PC’s in the NYU academic
community. (Please see November 26
for a comparable presentation for Apple
Macintosh owners.)

Repairing IBM PC’s
Tuesday, December 17

Creating Tables in
WordPerfect 5.1
Education Building, second floor, 1:00 pm
Given by Henry Mullish. “Tables” is a
feature of WordPerfect 5.1 (IBM PC
version) that can be used with any
document involving columns and tables.
This very flexible and fast new feature
promises to give WordPerfect documents
a new look and to facilitate preparation of
otherwise unwieldy documents. Reserva­
tions are required; please call Henry
Mullish at 998-3039.

WordPerfect Tables
Wednesday, September 25
Repeated: Wednesday, November 20

WordPerfect 5.1 Macros
Education Building, second floor, 1:00 pm
Henry Mullish will demonstrate how to
dramatically increase productivity when
working in WordPerfect 5.1 on the IBM
PC, by creating macros for common
tasks. No previous knowledge of macros
is required, although a knowledge of
WordPerfect would be helpful. Reserva­
tions are required; please call Henry
Mullish at 998-3039.

WordPerfect Macros
Wednesday, October 2
Repeated: Wednesday, November 27

Using Equation Mode in
WordPerfect
Education Building, second floor, 1:00 pm
Given by Henry Mullish. Equation Mode
promises to make WordPerfect (IBM PC
version) a major contender in the
technical word processing field. This new

(continued on following page)
feature of WordPerfect 5.1 helps you to type technical material in an attractive way. (No calculations are performed, though!) Reservations are required; please call Henry Mullish at 998-3039.

**WordPerfect Equation Mode**
Monday, November 4
Repeated: Wednesday, December 18

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**Topics in WordPerfect 5.1**

Education Building, second floor, 1:00 pm
These informal seminars are intended as a follow-up to the ACF’s introductory WordPerfect tutorials. Each session will focus on a selection of topics depending on attendees’ interests and needs.
Specific functions of WordPerfect and word processing tasks—such as sorting, grammar and style analyzers, WordPerfect’s speller and thesaurus, endnotes, footnotes, blocking and search—will be discussed off-the-cuff by Henry Mullish. Uses of locking documents and advanced features like customized formatting of date and time will be introduced. Attendees’ queries and participation will be welcome.

**WordPerfect Topics**
Wednesday, October 16
Repeated: Wednesdays, October 30, November 11, December 4

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**Special Topics: Data Analysis, Presentation**

**Graphics, HyperCard, and More**

**Survival Analysis**
Main Building, Room 509, 10:30 am
A series of three talks on survival analysis, given by ACF consultant Robert Yaffee.

The first lecture will be on life tables and will deal with distributional approaches to survival or mortality rates. The Kaplan-Meier estimator will be examined. Stratification will be discussed with significance tests between the strata. Programming examples using SPSS, SAS, BMDP, and LIMDEP will be used.

The second lecture will be on Cox proportional hazards regression models. Problems with time-dependent and time-varying covariates will be discussed, and estimation with maximum and partial likelihood will be examined. Goodness of fit tests and model interpretation will be included, as will programming examples using SAS and LIMDEP.

The third session will focus on continuous time parametric models. Topics will include the application of the exponential, Gompertz, Weibull, Makeham, log-normal, log-logistic, and gamma distributions in constructing accelerated failure-time models. Estimation, goodness of fit, and censoring problems will be analyzed with examples from SAS and LIMDEP. Problems of repeatable events and multiple spells will be addressed, with programming examples using the CTM program.

**Macintosh Graphics for Data Presentation**
Main Building, Room 509, 4:10 pm
ACF staff members will demonstrate several popular packages for Apple Macintoshes that enable you to create line and bar graphs, pie charts, etc. Such packages can be useful for the presentation of data and results in reports and papers. A number of these packages are available to users of the ACF’s instructional microcomputer labs.

**Mac Graphics**
Thursday, September 26

**FORTRAN for Scientific Applications**
Third Ave. No. Res. Hall, Basement, 10:00 am
A three-part introduction to the programming language FORTRAN, including calls to mathematical libraries. Individual programs on both the VMS and UNIX systems will be executed and discussed. In addition, there will be a short presentation on the editor vi.
Speaker: ACF consultant Eleanor Kolchin. Reservations are required; please call Frank LoPresti at 998-3398.

**FORTRAN (Part I)**
Monday, October 7
**FORTRAN (Part II)**
Tuesday, October 8
**FORTRAN (Part III)**
Wednesday, October 9
Introduction to HyperCard
Third Ave. No. Res. Hall, Basement, 10:00 am
A number of presentations in the NYU colloquia on uses of computers in higher education have featured HyperCard-based courseware developed by faculty and successfully integrated into their curricula.

Howard Fink will present hands-on training in the use of this flexible and comparatively easy-to-use authoring software for the Apple Macintosh. These nuts-and-bolts, how-to sessions will allow you to explore many of HyperCard’s features. Reservations: please call Howard Fink at 998-3500.

HyperCard (Part I)
Friday, October 4
HyperCard (Part II)
Friday, October 11
HyperCard (Part III)
Friday, October 18

Data Analysis:
Introduction to SPSS and SAS
Main Building, Room 509, 10:00 am
ACF consultant Bert Holland will provide an introductory-level overview of these two popular statistical packages available at NYU. Each session will focus on a particular package and will give a brief introduction to the analyses offered by the package. Discussion will include such topics as program structure, language syntax, data handling, and the running of programs written with the particular package of interest.

SPSS Intro
Friday, October 4
SAS Intro
Friday, October 11

Using Nota Bene
Education Building, second floor
Nota Bene is a full-featured word processing program running on IBM-type PC’s. It was created specifically for use by students, academics and scholars. It is extremely powerful and was designed for users with limited computer experience.

Part I, an introductory seminar, will cover basic editing, text formatting, printing, using the pop-up speller and thesaurus, and making use of the nine windows available in Nota Bene.

Part II will cover advanced topics like footnotes, endnotes, academic style sheets, and columns, and will give you a glimpse of Nota Bene’s built-in Text-Base, and the Nota Bene “add-ons” Ibid (a bibliography manager) and Lingua.

Nota Bene has gotten “high marks” from reviewers in both the computing and the academic worlds. It has been selected as a PC Magazine Editor’s Choice and endorsed by the Modern Language Association of America.

Nota Bene provides style sheets that can be of great help to writers of dissertations and other scholarly manuscripts. With these style sheets, you can have your work formatted automatically in a wide variety of academic styles, including MLA, APA, Chicago and Turabian.

Other features of interest to writers of scholarly papers include automatic outlining, indexing, tables of contents, footnotes or endnotes, bibliographies, and columns.

The speaker will be Robert Litt, formerly a technical support representative for Dragon Fly Software, the manufacturer of Nota Bene, and currently Chairman of the Nota Bene SIG of NPC User’s Group.

Nota Bene, Part I
Wednesday, September 25, 6:00 pm
Repeated: Wed., Oct. 23, 6:00 pm

Nota Bene, Part II
Saturday, September 28, 10:30 am
Repeated: Sat., Oct. 26, 10:30 am

(continued on following page)
Mathematica
Main Building, Room 509
Mathematica is a general system for doing mathematical computation.
It can function as a calculator, programming language, or system for representing mathematical knowledge. Results of calculations can be numerical, symbolic, or graphical.
Topics to be covered include symbolic and numerical methods, data visualization, programming. Speaker: ACF consultant Howard Fink.

Mathematica
Friday, October 25
10:00 am
Repeated: Friday, December 13
4:10 pm

Linear Structural Equation Modeling with LISREL
Main Building, Room 509, 10:30 am
ACF consultant Robert Yaffee will present a six part series on linear structural equation modeling with LISREL 7. Although the first lecture is primarily theoretical, other lectures will include programming examples as well as theory. A basic knowledge of matrix algebra, regression analysis and factor analysis is recommended as a prerequisite. While the lectures are free, registration is required. To register call Robert Yaffee at (212) 998-3402.

I. Introduction to Underlying Theory of LISREL
This lecture will present a short historical synopsis of structural equation modeling. It will include an introduction to confirmatory factor analysis, causality, path analysis, simultaneous equation models. Rudimentary estimation and model fitting will be talked about as well.

II. The Measurement Model
Validity and reliability theory are discussed. Validity coefficients are defined in a confirmatory factor analysis. Reliability is exemplified with a congeneric measurement model. Convergent and discriminant validity will be demonstrated with a multitrait-multimethod factor analysis.

III. The Structural Regression Model
Causality and causal modeling with LISREL are discussed in this lecture. Derivation of the covariance structure equations will be shown for examples with observed variables. Identification of the models will be treated here.

IV. The Full Model.
The full LISREL model is examined in this lecture. Estimation and fitting of the recursive and nonrecursive models will be presented. The index of stability will be explained as well.

V. Advanced Topics I
Path analysis with LISREL is the subject of this lecture. Multi-sample analyses and the extended LISREL model with covariance analysis of mean structures will also be examined.

VI. Advanced Topics II
The distributional assumptions of LISREL will be discussed. The levels of measurement required and PRELIS transformations of variables to accommodate these requirements will be addressed. Power analysis and new features of LISREL 8 will be included.

Introduction to LISREL Theory
Friday, November 1

The Measurement Model
Friday, November 8

The Structural Model
Friday, November 15

The Full Model
Friday, November 22

Advanced Topics I
Friday, December 6

Advanced Topics II
Friday, December 13

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**ACF Tutorials, Workshops and Seminars**

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<td><strong>Tutorials:</strong> Karel, 10, 2, 4:30; Analyzer, 1, Works, 2, 5:30; ÉMail (PC), 1, MS-DOS (Ill), 3</td>
<td>Workshops: UNIX, 6:30; Karel, 11, 2, 3 Works, 4:30; WYLBUR, 5:30, 6:30</td>
<td><strong>Seminar:</strong> Cox Models Tutorials: Karel, 10, 2, 4:30; Analyzer, 3; Works, 2 Workshops: dBASE IV, 9-12; MS Windows (PC), 1-4 Intro. Lecture: WYLBUR, 6</td>
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<tr>
<td><strong>Tutorials:</strong> Karel, 10, 2, 4:30; Analyzer, 11; Works, 2; UNIX, 2:30; Connecting (IBM PC), 5:30; WYLBUR, 5:30, 6:30; VAX/VMS, 6:30</td>
<td><strong>Seminar:</strong> Topics in UNIX (I) Tutorials: Karel, 11, 2, 3; VAX/VMS, 11:30; Works, 4:30; Connecting (Mac), 5:30; WordPerfect, 5:30</td>
<td><strong>Tutorials:</strong> Karel, 10, 2, 4:30; Analyzer, 1; Works, 2, 5:30; Karel, 10, 2, 4:30</td>
<td><strong>Seminar:</strong> Mac Graphics Tutorials: Karel, 11, 2, 3 UNIX, 6:30; Works, 4:30; WYLBUR, 5:30, 6:30 Workshops: Word Intro. (Mac), 1-3:30; Page-Maker (I), 9-11:30</td>
<td><strong>Seminar:</strong> Parametric Models Tutorials: Karel 10, 2, 4:30; Analyzer, 3; Works, 2 Workshops: WordPerfect Intro., 9-12; WordPerfect Intermediate, 1-4 Intro. Lecture: WYLBUR, 6</td>
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<tr>
<td><strong>Tutorials:</strong> Karel, 10, 2, 4:30; Works, 2, UNIX, 2:30; Connecting (IBM PC), 5:30; WYLBUR, 5:30, 6:30</td>
<td><strong>For further information</strong> on microcomputer workshops, please see page 33; on tutorials, page 34-35; on talks and seminars, pages 36-42. Some events require registration, and there is a fee for microcomputer workshops. <strong>For other important dates for ACF users</strong> — account registration and renewal, holiday schedule, and so on. Please see page 32. <strong>Please note</strong> that Karel, Analyzer, and some Works tutorials are offered for students in particular classes. Please check pages 34 - 35 for details.</td>
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**October**

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<tr>
<th>MONDAY</th>
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<th>WEDNESDAY</th>
<th>THURSDAY</th>
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<tr>
<td>Tutorials: UNIX, 2:30; Connecting (IBM PC), 5:30; VAX/VMS, 6:30</td>
<td><strong>Seminars:</strong> Topics in VMS (I); Supercomputer Access at NYU Tutorials: VAX/VMS, 11:30; Connecting (Mac), 5:30; WordPerfect, 5:30</td>
<td>Seminar: WordPerfect Topics Tutorials: Works, 5:30; ÉMail (PC), 1, MS-DOS (Ill), 3</td>
<td>Tutorials UNIX, 6:30 Workshop: Word Intro. (Mac), 1-3:30; Excel (Mac), 9-11:30</td>
<td>Seminars: Hypercard (III); SPSS Data Entry Workshops: WordPerfect Intro., 9-12; Lotus, 1-4</td>
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<tr>
<td><strong>Columbus Day (observed)</strong></td>
<td><strong>Seminars:</strong> Topics in VMS (II) Tutorials: VAX/VMS, 11:30; Connecting (Mac), 5:30; WordPerfect, 5:30</td>
<td>Seminar: WordPerfect Topics Tutorials: Works, 5:30</td>
<td><strong>Tutorials:</strong> UNIX, 6:30 Workshop: Macintosh Graphics, 9-11:30</td>
<td><strong>Seminar:</strong> Mathematics Workshops: dBASE IV, 9-12; WordPerfect Adv., 1-4</td>
</tr>
<tr>
<td>Tutorials: UNIX, 2:30; Connecting (IBM PC), 5:30; VAX/VMS, 6:30</td>
<td><strong>Seminars:</strong> Topics in VMS (III) Tutorials: VAX/VMS, 11:30; Connecting (Mac), 5:30; WordPerfect, 5:30</td>
<td><strong>Tutorials:</strong> UNIX, 6:30 Workshop: Word Intro. (Mac), 9-11:30</td>
<td><strong>Seminar:</strong> IBM PC Graphics Tutorials: UNIX, 6:30 Workshop: Word Intro. (Mac), 9-11:30</td>
<td><strong>Seminar:</strong> Mathematics Workshops: dBASE IV, 9-12; WordPerfect Adv., 1-4</td>
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### November

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<tr>
<th>MONDAY</th>
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<tr>
<td><strong>Seminar:</strong> WordPerfect Equation Mode</td>
<td><strong>Seminar:</strong> Visualization Tutorials: UNIX, 2:30; Connecting (IBM PC), 5:30; VAX/VMS, 6:30</td>
<td><strong>Seminar:</strong> LATEX (I) Tutorial: Works, 5:30</td>
<td><strong>Tutoria:</strong> UNIX, 6:30</td>
<td><strong>Seminar:</strong> Introduction to LISREL Theory Workshops: WordPerfect Graphics Intro., 9-12; MS Windows (PC), 1-4</td>
</tr>
<tr>
<td><strong>Tutorials:</strong> UNIX, 2:30; Connecting (IBM PC), 5:30; VAX/VMS, 6:30</td>
<td><strong>Tutorials:</strong> VAX/VMS, 11:30; Connecting (Mac), 5:30; WordPerfect, 5:30</td>
<td><strong>Tutorials:</strong> UNIX, 6:30</td>
<td><strong>Workshops:</strong> Word Intro. (Mac), 9-11:30; Word Interned. (Mac), 1-3:30; Hypercard (I), 9-11:30</td>
<td><strong>Workshops:</strong> WordPerfect Intro., 9-12; WordPerfect Interned., 1-4</td>
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<tr>
<td>Veterans' Day</td>
<td>Election Day</td>
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<td><strong>Seminars:</strong> LATEX (II) <strong>Tutorials:</strong> Works, 5:30; E-Mail (Mac), 2:30; MS-DOS (I), 3</td>
<td><strong>Seminars:</strong> The LISREL Measurement Model Workshops: Word Perfect Intro. (PC), 9-12; dBASE IV, 1-4</td>
</tr>
<tr>
<td><strong>Tutorials:</strong> UNIX, 2:30; Connecting (IBM PC), 5:30; VAX/VMS, 6:30</td>
<td><strong>Seminar:</strong> Internet Services; Networks for Microcomputers Tutorials: VAX/VMS, 11:30; Connecting (Mac), 5:30; WordPerfect, 5:30</td>
<td><strong>Seminars:</strong> WordPerfect Macros Tutorial: Works, 5:30</td>
<td><strong>Tutoria:</strong> UNIX, 6:30</td>
<td><strong>Seminars:</strong> The Full LISREL Model Workshops: WordPerfect Intro., 9-12; Lotus, 1-4</td>
</tr>
<tr>
<td><strong>Tutorials:</strong> UNIX, 2:30; Connecting (IBM PC), 5:30; VAX/VMS, 6:30</td>
<td><strong>Seminar:</strong> Repairing Macs Tutorials: VAX/VMS, 11:30; Connecting (Mac), 5:30; WordPerfect, 5:30</td>
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<td><strong>Tutoria:</strong> UNIX, 6:30</td>
<td><strong>Events:</strong> Thanksgiving Weekend Fri. and Sat.- holiday hours; Sun.- all sites closed</td>
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### December

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<tr>
<th>MONDAY</th>
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<tbody>
<tr>
<td><strong>Tutorials:</strong> UNIX, 2:30; Connecting (IBM PC), 5:30; VAX/VMS, 6:30</td>
<td><strong>Seminar:</strong> Bitnet Services Tutorials: VAX/VMS, 11:30; Connecting (Mac), 5:30; WordPerfect, 5:30</td>
<td><strong>Seminar:</strong> WordPerfect Topics Tutorial: Works, 5:30</td>
<td><strong>Tutoria:</strong> UNIX, 6:30</td>
<td><strong>Seminar:</strong> LISREL Advanced Topics (I) Workshops: WordPerfect Intro., 9-12; WordPerfect Graphics Intro., 1-4</td>
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<tr>
<td><strong>Tutorials:</strong> UNIX, 2:30; Connecting (IBM PC), 5:30; VAX/VMS, 6:30</td>
<td><strong>Tutorials:</strong> UNIX, 2:30; Connecting (IBM PC), 5:30; VAX/VMS, 6:30</td>
<td><strong>Seminar:</strong> WordPerfect Mail Merge Tutorial: Works, 5:30; E-Mail (Mac), 2:30; MS-DOS (I), 3</td>
<td><strong>Tutoria:</strong> UNIX, 6:30</td>
<td><strong>Seminars:</strong> Mathematics; LISREL Advanced Topics (II) Workshops: WordPerfect Intro., 9-12; Adv. WordPerfect Graphics, 1-4</td>
</tr>
<tr>
<td><strong>Tutorials:</strong> UNIX, 2:30; Connecting (IBM PC), 5:30; VAX/VMS 6:30</td>
<td><strong>Seminar:</strong> Communicating Via NYU-NET Tutorials: VAX/VMS, 11:30; Connecting (Mac), 5:30; WordPerfect, 5:30</td>
<td><strong>Seminar:</strong> WordPerfect Equation Mode Tutorial: Works, 5:30; E-Mail (PC), 1; MS-DOS (II), 3</td>
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<td><strong>Final Examinations begin.</strong></td>
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<td><strong>Tutoria:</strong> UNIX, 6:30</td>
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### Saturday Events:

**Tutoria**
- **Sept 7 - Dec 14**
  - Connecting (PC) - 1 pm
  - Connecting (Mac) - 2:30 pm
  - VAX/VMS - 1 pm
  - UNIX - 3 pm

**Sept. 7-28**
- Karel - 11 am, 2 pm
- Works - 4:30 pm

**Seminars**
- **Sept 28, Oct 26**
  - Advanced Notes Bene 10:30 am

Please see pages 33-42 for complete schedules of workshops, tutorials, and talks, and for information on registration and locations.

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Academic Computing and Networking at NYU, September 1991, page 44.
Important ACF Telephone Numbers

General Information (ACF) 998-3333
Account Information 998-3035
Computer Status (recording) 998-3433
Computer Documentation 998-3036
Faculty Microcomputer Lab 998-3044
Tape Librarian 998-3452
Applications Consultants:
   14 Washington Place 998-3399
   Tisch Hall 998-3434
   Education Building 998-3435
   Warren Weaver Hall 998-3037
   Third Ave. North Res. Hall 998-3500

Computer Operators:
   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)
NYU 53600 300 - 2400
Off Campus 995-3600 300 - 2400
995-4335* 300 - 1200
*This number is recommended if you are using an old-style modem without error-correcting.

Dial-in Access to ACF Computers
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NYU 53600 300 - 2400
Off Campus 995-3600 300 - 2400
995-4335* 300 - 1200
*This number is recommended if you are using an old-style modem without error-correcting.

Hours at ACF Sites

Regular Hours

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<tr>
<td>14 Washington Place</td>
<td>8:30 a - 11:30 p</td>
<td>8:30 a - 5:30 p</td>
<td>closed</td>
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<tr>
<td>Tisch Hall</td>
<td>8:30 a - 11:30 p</td>
<td>8:30 a - 5:30 p</td>
<td>closed</td>
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<tr>
<td>Education Building</td>
<td>8:30 a - 11:30 p</td>
<td>8:30 a - 5:30 p</td>
<td>closed</td>
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<tr>
<td>Third Ave. North</td>
<td>10:30 a - 1:30 a</td>
<td>10:30 a - 5:30 p</td>
<td>10:30 a - 5:30 p</td>
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Consultants:

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<td>12:00 p - 5:30 p</td>
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<tr>
<td>Tisch Hall</td>
<td>9:00 a - 9:00 p</td>
<td>9:00 a - 5:00 p</td>
<td>closed</td>
</tr>
<tr>
<td>Education Building</td>
<td>8:30 a - 9:00 p</td>
<td>9:00 a - 5:00 p</td>
<td>closed</td>
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<tr>
<td>Third Ave. North</td>
<td>10:30 a - 1:30 a</td>
<td>10:30 a - 5:30 p</td>
<td>10:30 a - 5:30 p</td>
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Holiday Hours*

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<tbody>
<tr>
<td>14 Washington Place</td>
<td>10:30 a - 5:30 p</td>
<td>10:30 a - 5:30 p</td>
<td>(To be announced)*</td>
</tr>
<tr>
<td>Tisch Hall</td>
<td>10:30 a - 5:30 p</td>
<td>10:30 a - 5:30 p</td>
<td>(To be announced)*</td>
</tr>
<tr>
<td>Education Building</td>
<td>10:30 a - 5:30 p</td>
<td>10:30 a - 5:30 p</td>
<td>(To be announced)*</td>
</tr>
<tr>
<td>Third Ave. North</td>
<td>10:30 a - 5:30 p</td>
<td>10:30 a - 5:30 p</td>
<td>(To be announced)*</td>
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* A final holiday schedule will be posted via our online news and bulletin board facilities. Note: The ACF offices in Warren Weaver Hall are closed on University holidays.
Featuring:

☐ Instructional Computing
☐ Networks and Network Services
☐ Microcomputers
☐ Computing in the Humanities
☐ Arts and Media
☐ Graphics and Printing
☐ Social Science Computing
☐ Library Computing
☐ Computing at the Law School
☐ Purchasing Services Notes
☐ From the NYU Book Centers