Athena Insider

The Project Athena Faculty Newsletter

An aperiodic publication of the Faculty Liaison Office

Users: 8883
Workstations: 1031
Servers: 100
Printers: 88

Volume 1, Issue 1 January 1990

Why read "Athena Insider?"

Welcome to the first issue of *Athena Insider*, the Athena Faculty Newsletter.

Our goal for this newsletter is to keep you, the MIT Faculty, informed of changes and additions to the Athena system which affect your use of Athena for your classes. We will also present articles on existing software and tools on the system and overviews of the resources that are available to you. We particularly hope to spark some interest in those of you who haven't used the system for their courses by presenting some articles on how the system is being used currently in courses throughout the Institute.

In This Issue:

Our other purpose is to invite all of you to keep in contact with us at the Faculty Liaison office. If you've never used the system before, we'd be happy to arrange a "tour" of the system for you or supply you with some overviews of Athena and the available software; we can provide assistance setting things up for a new course, set you up with an account, help you dial in ... in general, we're here to be your first point of contact for questions about all aspects of Athena.

Anne R. LaVin	x3-0115	Faculty Liaison
Naomi Schmidt	x3-0170	Manager of Educational Initiatives

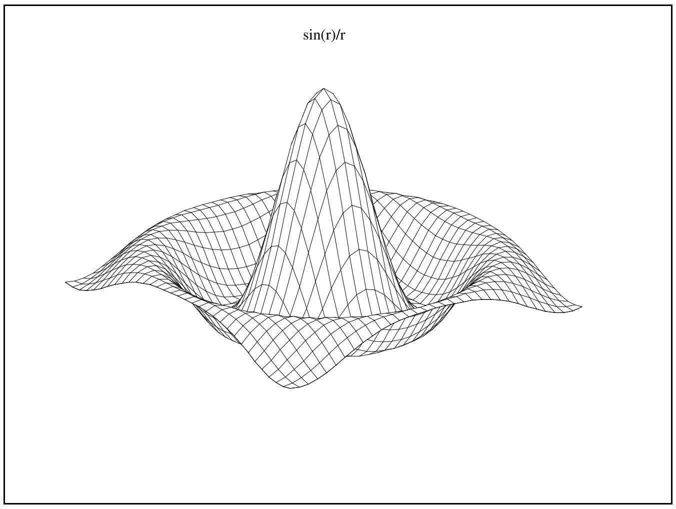
You can send email to us via the Faculty Liaison mailing list – just address your email to "`f_l@athena`," or you can give us a call. We look forward to hearing from you!

Athena: A Parable

Earll M. Murman

In the Spring of 1983, a new child was born on the banks of the Charles. The proud parents and generous godparents declared "Let us name this child Athena, for one day she will be a powerful goddess of wisdom."

The students began to play with Athena and the scholars set about to work with her and write scrolls so that she could be wise and help them teach. But she was a difficult child. At times the young adolescent



Graphics like this can be produced on Athena; see the Matlab article for details.

was uncoordinated and lacked stamina. She ran badly and froze and the students jeered her. The scholars said "For Athena to be wise she needs tools because it is difficult for us to write our scrolls." Some also said, "She is not friendly and beautiful like the new Apple Blossom queen from Cupertino."

But the parents spoke, "Be patient and work with her, for she is only a child," and some indeed listened and worked with her. Athena grew in many ways, and held strong and added more stations for work. Visitors came by the tens from around the world to see the young goddess and to praise her. And now we say to you, please gather and listen. Learn of Athena's new soft wares and of how the parents are working to shape the young adult Athena. Hear of the scholars' scrolls that have already been written and how they have helped them teach. Help us by giving us your ideas and thoughts on how to nurture her and make her more friendly; for she values your friendship.

As of Mid-January, 1990, Athena will have undergone an extensive internal restructuring. One of the goals of this restructuring is to ensure a greater emphasis on the needs of the Faculty with respect to their Athena usage. As part of this new structure, and with this goal in mind, an "Educational Initiatives" group has been created at Project Athena. The EI group, managed by Naomi Schmidt, has been formed to focus on the needs of faculty who are using or want to use Project Athena. The group will provide

- faculty liaisons to assist you in arranging for use of Athena or answering your questions,
- software support staff for MIT-developed and third party applications software, and
- development of better software tools for building application programs.

Please take some time to browse the newsletter to learn more about their activities.

In addition, please call me at x3-1327 if you have any questions, requests, or would like me to come speak to your department about where we stand and where we are going.

[Prof. Murman is the Director of Project Athena, and a Faculty Member of the Department of Aeronautics and Astronautics.]

So you want an Athena Account. . .

All Institute faculty are eligible for an Athena account. The account automatically gives each user 1.2 Megabytes of backed-up online storage, access to Athena printers (starting in the Fall of 1990, there will be a charge for printing above a default allotment), online services, and all Athena software. Athena does not attempt to regulate how these basic resources are used; however, as an educational facility, we cannot support any activities (for example, research) that require more than these default resources unless they are directly related to a curriculum and will be used eventually in a class.

To get an account, just contact the Faculty Liaison Office, and we'll enter you into our user database. You can then go to any Athena cluster, start up a workstation and run the "register" program by clicking any mouse button when the mouse pointer is on the section of the screen marked "Click here to register for an account." The "register" program lets you choose your username (you should choose one you like, since you *cannot* change it afterwards) and choose your password (your password should be a string of characters that is easy for you to remember, and is neither a name, simple number nor a word found in a dictionary!). Approximately 24 hours after you have registered, your account should be fully active.

. . . Or How About a Workstation?

As part of an Athena experiement over the past year, Project Athena has granted workstations to faculty for their offices. These requests have been answered on a first come, first serve basis. The faculty members have provided or paid for:

- space for the workstation
- the monthly network access fee
- the network installation fee

It has been very helpful to us to have the faculty participating in Athena this way, and we're planning on continuing this program. However, with increasing demand for the workstations, we will begin requiring the faculty members to contribute some fraction of the workstation cost.

Any interested faculty should contact Prof. Earll Murman for more information.

Contributors: Earll M. Murman, David Flanagan

Editing & Typesetting . . . . Anne R. LaVin

This document was written and typeset completely on Project Athena equipment, and formatted with the LaTeX document preparation system. No scissors or glue were used! Many thanks to: Mark Rosenstein for his help and advice on formatting and style; Jonathan Kamens, Marc Horowitz and Barry Jaspan for their LaTeX advice and other comments; and Andrew Greene for being a TeX guru in general.

What Is On the System, Anyway?

A comprehensive list of all the software supported and partially supported by Athena and other groups at MIT is available online. To look at it, type:

```
attach info
more /mit/info/Athena_Software
```

Or, if you like, we'd be happy to send it to you.

Also available is a list of all the courses at MIT that use Athena, and the software they use. This is available online via the following commands, or, as above, we can send you a copy:

```
attach instructor
attach athenadoc
cd /mit/instructor
/mit/athenadoc/viewdoc Courses.PS
```

The "viewdoc" program is an online document previewer. As it starts up, a flickering rectangle will appear. Move the mouse so the mouse pointer (the upper left corner of the flickering viewdoc window) is in the desired location, then click the left mouse button. The window will then fill with text. At the upper left of the page are three "buttons": "Next," "Back," and "Menu." The "Next" button turns to the next page, "Back" is the previous page, and "Menu" pops up a small menu to let you quit the program.

Athena Develops Tools for Writing Courseware

David Flanagan

The Motif widget library is now available on Project Athena workstations in the "motif" locker. These "widgets" (a widget is a user-interface primitive, a building block for graphical user interfaces) help the developer to create point-and-click style applications. Included in the library are pull-down menus, push buttons, toggle buttons, input fields for entering text and numbers, scrollbars, lists of selectable items, simple dialog boxes, and widgets specialized for laying out the others on the screen. (The Motif Window Manager, "mwm" is also new on Athena. See the article on the New Athena Release for more information.)

The Motif widgets come with a compiler for the User Interface Language (UIL). This language simplifies the task of designing and laying out a graphical user interface. Tools and convenience routines for use with the Motif widgets and with UIL have been developed at Project Athena, and also help to make user interface development easier.

To learn more about the Motif widget set, the UIL language and compiler, and the convenience routines developed at Athena, attach the "motif" locker and read the file /mit/motif/README. This document contains pointers to the documentation you should read, instructions for compiling and linking programs that use the Motif widgets, helpful mailing lists you can subscribe to, and other important information.

A related effort is underway at Project Athena to develop a library of widgets for use in technical courseware. This library will complement the Motif widget library with user interface functionality not available from those widgets. It will provide commonly needed functionality for technical software such as the display of greek and mathematical symbols, tabular display of numeric parameters, and two dimensional function and data plotting.

Fall 89 "Stats"

This past fall semester was very busy at Athena, and saw a number of significant additions to the system. Foremost was the addition of graduate students to Athena; they can now create their own accounts, as undergraduates can, without the need for special permission. Special students and others enrolled in MIT subjects can also use Athena with permission of the instructor. This fall, 90% of the undergraduates and 46% of the graduate students opened accounts. On a typical weekday, we had 2000-2500 different users log on to Athena.

We deployed 325 new workstations this fall, bringing our total installation to slightly over 1000. A conscious effort is being made to work with Departments to install clusters under the control of the department. So far we have or are in the process of installing 25 of these clusters in approximately two-thirds of the Institute departments. We also have installed workstations in about 150 faculty member's offices who have requested them. Grants of equipment to both departments and faculty offices are on a first come, first serve basis.

Over 100 subjects a semester use Athena officially for assignments. Around half of these courses use software packages written at MIT, made available to the students in publically readable courseware storage "lockers." The others use a variety of system software tools maintained by Athena such as *Matlab*, a mathematical plotting and matrix manipulation package (described in this issue of the newsletter), *turnin/pickup*, an electronic assignment-turnin facility, and many others.

Develop on your Mac; Run on Athena!

We're looking for volunteers for a few pilot projects exploring the use of "cT," a software authoring environment developed by Dr. Bruce Sherwood at Carnegie-Mellon University.

"cT" is a simple, BASIC-like programming environment complete with built-in functions, control structures (if-then-else, etc.) and graphics capabilities. It has the advantage of being portable to multiple computer platforms with a minimum of effort; code developed on a Macintosh can be copied over and run directly on an Athena machine. The programs can be developed interactively, (interpreted) and then later compiled for speed of execution.

"cT" has been used very successfully at a number of other educational institutions, and we are very interested in exploring its potential at the Institute. Any interested faculty should contact the Faculty Liaison Office.

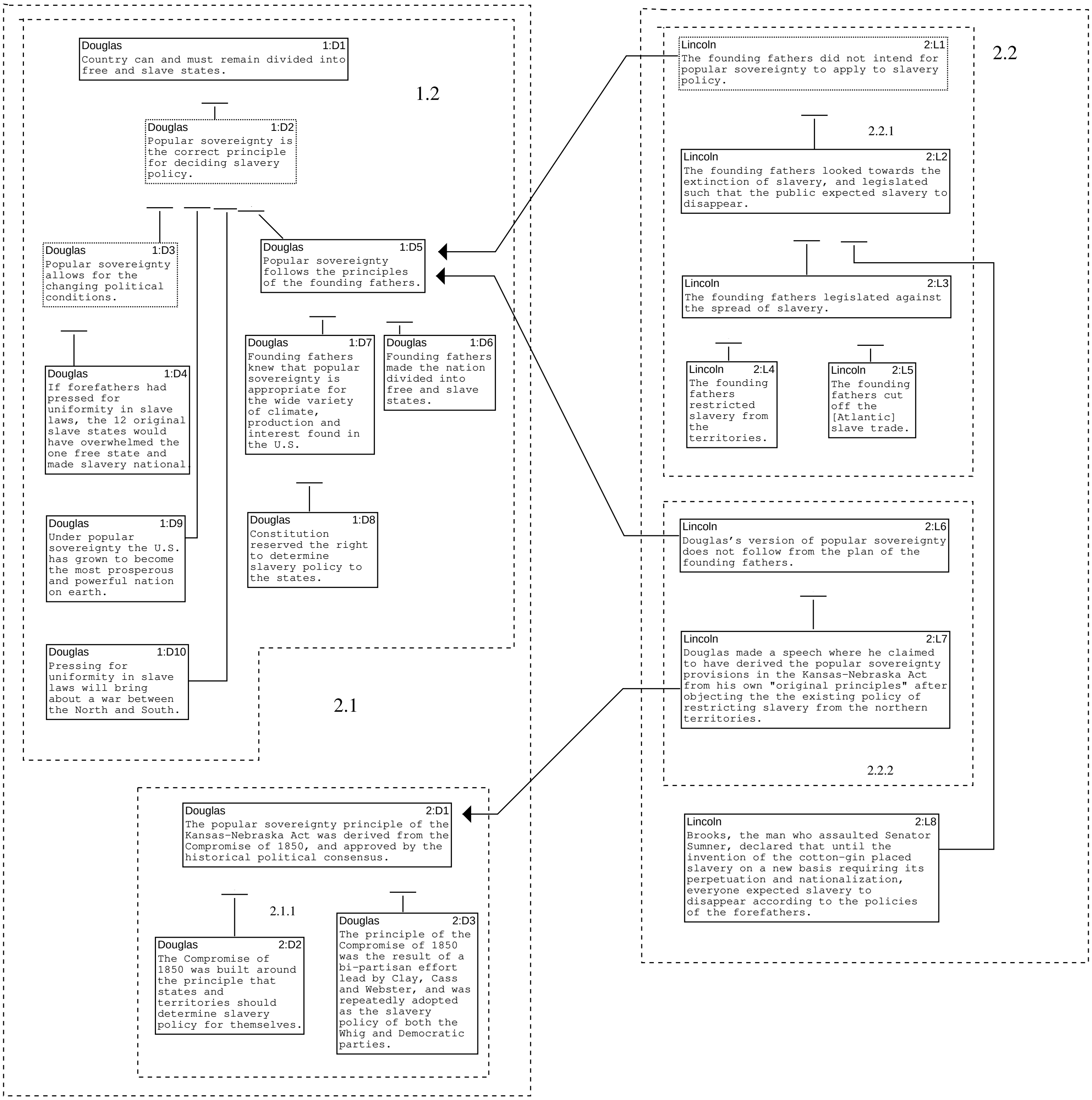
Course Profile: Prof. Hayward Alker

Prof. Hayward Alker, in his course 17.803 "Debates and Arguments" takes advantage of the interactive graphical cabilities of workstations to examine the structure of arguments in innovative ways. The program his students use is called "GMATS," for "**G**raphs **M**ake **A**rgument **T**heory **S**imple."

The motivation for presenting debates this way was a result of Prof. Alker's feeling that mathematics and statistics "didn't quite catch all the phenomenon of politics and public policy arguments." In 1985, Prof. Alker supervised an undergraduate, Erik Devereux, in a Bachelor's thesis in the Political Science Department which presented a synthesis of the existing methods for presenting and analyzing informal logic, using the Lincoln-Douglas Debates as an example. The thesis centered around a graphical representation of the dialogical structure of the debates; it showed clearly the exceptionally coherent and skillful structure of the Debates. Shortly thereafter, David Simson, an undergraduate in the Department of Computer Science began work on a thesis to write an Athena application that allowed these "argument graphs" to be drawn and manipulated on the screen. The result is GMATS.

GMATS allows the student to examine sample debates from an online collection (being compiled by Prof. Alker and his students) or to create a new graph for a new debate of their choosing. The program prompts the user for the text of each claim or thesis, and allows the diagramming of various logical links between them. (See, at right, a small section from the graph of one of the Lincoln-Douglas Debates.) Claims can have their supporting arguments identified (the short horizontal line and vertical line beneath a text box represent support); the relationship between a claim and an attacking claim is represented with an arrow. It is also possible to represent other more complex relationships of facts, such as claims that qualify or warrant another. The student may, from the original texts of the debate, contruct what he or she feels are the connecting links and qualifications in the argument; they can also replay the history of previous real time debates.

"We're creating an alliance between classical modes of inquiry, classical models from the traditions of dialectical analysis, and modern graphical technology," says Alker. "It's another way to view the phenomenology of people arguing as a body, and creates an understanding of the creativity involved in debate."


1.2
Douglas 1:D1
Country can and must remain divided into free and slave states.
Douglas 1:D2
Popular sovereignty is the correct principle for deciding slavery policy.
Douglas 1:D3
Popular sovereignty allows for the changing political conditions.
Douglas 1:D5
Popular sovereignty follows the principles of the founding fathers.
Douglas 1:D4
If forefathers had pressed for uniformity in slave laws, the 12 original slave states would have overwhelmed the one free state and made slavery national.
Douglas 1:D7
Founding fathers knew that popular sovereignty is appropriate for the wide variety of climate, production and interest found in the U.S.
Douglas 1:D6
Founding fathers made the nation divided into free and slave states.
Douglas 1:D9
Under popular sovereignty the U.S. has grown to become the most prosperous and powerful nation on earth.
Douglas 1:D8
Constitution reserved the right to determine slavery policy to the states.
Douglas 1:D10
Pressing for uniformity in slave laws will bring about a war between the North and South.
2.1
Douglas 2:D1
The popular sovereignty principle of the Kansas-Nebraska Act was derived from the Compromise of 1850, and approved by the historical political consensus.
2.1.1
Douglas 2:D2
The Compromise of 1850 was built around the principle that states and territories should determine slavery policy for themselves.
Douglas 2:D3
The principle of the Compromise of 1850 was the result of a bi-partisan effort lead by Clay, Cass and Webster, and was repeatedly adopted as the slavery policy of both the Whig and Democratic parties.
2.2
Lincoln 2:L1
The founding fathers did not intend for popular sovereignty to apply to slavery policy.
2.2.1
Lincoln 2:L2
The founding fathers looked towards the extinction of slavery, and legislated such that the public expected slavery to disappear.
Lincoln 2:L3
The founding fathers legislated against the spread of slavery.
Lincoln 2:L4
The founding fathers restricted slavery from the territories.
Lincoln 2:L5
The founding fathers cut off the [Atlantic] slave trade.
Lincoln 2:L6
Douglas's version of popular sovereignty does not follow from the plan of the founding fathers.
Lincoln 2:L7
Douglas made a speech where he claimed to have derived the popular sovereignty provisions in the Kansas-Nebraska Act from his own "original principles" after objecting the the existing policy of restricting slavery from the northern territories.
2.2.2
Lincoln 2:L8
Brooks, the man who assaulted Senator Sumner, declared that until the invention of the cotton-gin placed slavery on a new basis requiring its perpetuation and nationalization, everyone expected slavery to disappear according to the policies of the forefathers.

System Tools: *Matlab*

Matlab is an interactive tool for calculation and plotting. It is fundamentally based on matrix manipulations (The name "Matlab" comes from **mat**rix **lab**oratory.) It is well suited for courses involving matrix calculations (such as modern control theory) or "vectors" of data (such as signal analysis).

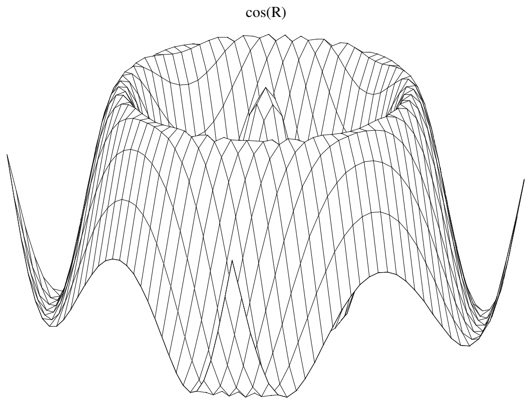
The interface to Matlab kernal is like a simple programming language, complete with built-in functions, and control structures for the calculations. These central, intrinsic routines include basic mathematical operators, trigonometric functions, etc. Matlab's enormous power lies in the fact that packages or "toolboxes" can easily be created that build upon the basic fuctions. The example given below is taken from the "demo" function (part of the toolboxes that come with Matlab), built up of a series of basic Matlab commands. The toolboxes contain advanced mathematical functions (bessel functions, splines, polynomial evaluation, numerical function integration, for example), signal processing tools, and a "Robust Control Toolbox" for control theory.

In addition to the toolboxes that come with Matlab, users can create their *own* toolboxes, with functions for their specific needs. Many current Matlab users have taken just this approach, and have written toolboxes for their classes to use in homework or design problems.

Below is an example, taken from the Matlab demos, along with the resultant graphics. The actual Matlab commands used to do the calculations are shown to provide a flavor of the environment.

```
%  We'll plot cosine(R) with a
%  3-d perspective surface
%  created using the "mesh" command.
%
%  First we form a radius matrix R that
%  contains elements whose values
%  are the "distance" from the center
%  of the matrix.
%
x = -8: .5: 8;
y = x';
x = ones(y) * x;
y = x';
R = sqrt(x.^2 + y.^2) + eps;
x=[];
y=[];
%
%  Now we form a matrix of  sin(r)/r and
%  plot it using "mesh":
%
mesh(cos(R)), title ('cos(R)')
```

For those already familiar with the PC or Macintosh versions of Matlab, you may run a demo of the athena version as follows:



Sample matlab output: 3D plot of $\cos(R)$

At the athena prompt, type:

```
setup matlab
```

A flickering outline of a window will appear on the screen with the upper left corner at the current mouse pointer location. Just click the left mouse button at the desired location of the upper left corner of your window (the upper left of your screen is a good location). Move the mouse to that new window and type "matlab" and the program will start up. You will then be prompted for another new window (this window will be your graphics window). Click the left mouse at the desired upper left corner of the graphics window. To run the matlab demonstration program, make sure your mouse is in the text window, and simply type "demo" at the matlab prompt ">>," and follow the menus.

If you are unfamiliar with Matlab, and would like a tour of its functions, please give the Faculty Liaison Office a call.

Matlab documentation is available for users in the Athena public cluster document racks, or may be bought through Athena. Once again, contact the Faculty Liaisons.

New Athena Release

A new release of the Athena system software, called "6.4R," will take place this month on January 17th. All public workstations will be automatically updated; if you have a workstation in your office or lab and have made it "private," then the update to the new version will have to be done manually. Please contact the operations staff by sending mail to "`op@athena`" for assistance with this. If you have any questions about what state your workstation is in, just give the Faculty Liaison Office a call.

The most user-visible change is that the default window manager will be changed to the Motif window manager, "mwm." This new window manager is more up to date and complies with current standards for inter-program communication, which the old default manager did not. It is being adopted as a standard not only on workstations but on microcomputers as well. One result of this is that some software compiled under the last release **may not work under mwm** if it does any screen graphic display. If you have not already done so, you should test out any course software you use by logging in as the user "`mwm_user`" with the password "`athena`." Then just run your software as usual. If your software does have problems, Athena will provide programmer assistance to help you get it back up and running; call the Faculty Liaisons for assistance. Instructions for using mwm are included in the User Release Notes for 6.4R available in all the public clusters.

Many other changes and bug fixes are included in this release; users are encouraged to browse through the Release Notes for a more complete list.

Athena IAP Courses

- **Project Athena Minicourse Series**
  Leaders: Athena Minicourse Instructors
  Schedule: Mon-Fri, Jan 8-31, 3-343.
  Contact: Judith Provost, E40-337, x3-0163, email to judi@athena.
  No preregistration necessary.

  - Title: How To Get Around Athena
    Schedule: Mon, Jan 8, 22; Wed, Jan 10-24, 12 noon-1 pm, 3-343.
  - Title: Basic Word Processing
    Schedule: Mon, Jan 8, 22, Wed, Jan 10-14, 1-2 pm, 3-343.
  - Title: Advanced Word Processing
    Schedule: Tues, Jan 9, 23, Wed, Jan 31, Thurs, Jan 11, 25, 12 noon-1pm, 3-343.
  - Title: Scribe Reports
    Schedule: Tues, Jan 9, 23, Wed, Jan 31, Thurs, Jan 11, 25, 12 noon-1pm, 3-343.
  - Title: Scribe Thesis
    Schedule: Fri, Jan 12, 26, 12 noon-1 pm, 3-343.
  - Title: Scribe Math
    Schedule: Fri, Jan 12, 26, 1-2 pm, 3-343.
  - Title: Matlab
    Schedule: Mon, Jan 15, 29, Thurs, Jan 18, 12 noon-1 pm, 3-343.
  - Title: RS/1
    Schedule: Mon, Jan 15, 29, Thurs, Jan 18, 1-2 pm, 3-343.
  - Title: Word Processing with Andrew EZ
    Schedule: Tues, Jan 16, 30, Fri, Jan 19, 12 noon-1 pm, 3-343.
  - Title: LaTeX
    Schedule: Tues, Jan 16, 30, Fri, Jan 19, 1-2 pm, 3-343.

- **Motif Marathon: An Intro To Programming With Motif**
  Leader: David Flanagan
  Schedule: Wed, Jan 24, 9 am-5 pm, 37-212.
  Contact: David Flanagan, E40-331
  Preregister by Jan 21 via email *only* to djf@athena.

- **Introduction To Programming In C**
  Leader: Gary Bean
  Schedule: Thurs-Fri, Jan 11-19, 1-3 pm, E40-302.
  Contact: Judith Provost, E40-337
  Preregister by Jan 10 via email to drwho@athena.

- **Full-Featured Programming At Athena**
  Leader: Dan Geer
  Schedule: Tues, Jan 23, 9 am-5 pm, E40-302.
  Contact: Dan Geer, E40-342f

- **Intro To HOOPS**
  Leader: Paul Boutin
  Schedule: Wed, Jan 10, 2-4 pm, E40-302.
  Contact: Paul Boutin, E40-300, X3-0146

  Special featured guest: Milt Capsimalis of Ithaca Software, coauthor of HOOPS. Milt will demonstrate educational engineering software from Project SOCRATES at Cornell and answer any technical questions.

Please see the IAP Guide for more details.

Final Words

We hope you've enjoyed the first issue of *Athena Insider*. If you have any ideas for topics you would specifically like addressed in future issues, please call us, or send email. In any case, we'll gladly accept all feedback and suggestions.

As mentioned earlier, don't forget to test out your Athena courseware under the new window manager, "mwm." Just login as "`mwm_user`" with password "`athena`" and run your software as usual. Contact us with any problems.

And, if you're using Project Athena in your course this spring, and haven't sent us back a "Subject Request Form," please give us a call, and we can take all the information over the phone.

Have a nice IAP!

In Our Next Issue:

The Visual Courseware Group

Developing multi-media software at Athena

Andrew EZ

A What-You-See-Is-What-You-Get editor

New Improved Dialup System

Turnin/Pickup

A way to electronically turn in and grade homework assignments

FROM:

Project Athena Faculty Liaison Office
E40-343A

INTERDEPARTMENTAL