BREAKING THROUGH TECHNOLOGICAL BARRIERS

AMCBT 1995 FALL MEETING
TENTATIVE SCHEDULE
Alverno College
Milwaukee, Wisconsin
SEPTEMBER 28-30, 1995

As of the time that Bioscene went to press, final room assignments, registration forms, and housing information was not received. Therefore, please expect that information to arrive separately. If you need any more immediate information, please contact the AMCBT Local Arrangements Chairperson, Dr. Pat Bowne, Department of Biology, Alverno College, 3401 S. 39th St., P. O. Box 343922, Milwaukee, WI 53234-3922; email: pbowne@omnifest.uwm.edu; FAX: (414)-382-6354; Voice: (414)-382-6077.

Thursday, September 28

6:00-8:00 p.m. REGISTRATION RECEPTION Nursing Building
8:00 p.m. OPENING SESSION Nursing Building, Wehr Hall
Welcome for AMCBT
Donald “Buzz” Hoagland, Program Chair
Patricia Bowne, David Ferris, Leona Truchan, Local Arrangements

WELCOME to Alverno College
PRESIDENTIAL GREETING: Harold Wilkinson

OPENING ADDRESS:
Making Sense of New Medical Technologies
Suzanne Amador, Department of Physics, Haverford College, PA

9:00 p.m. EXECUTIVE COMMITTEE MEETING
(to immediately follow opening session)

6:00-8:00 p.m. & 9:00-12:00 midnight OPEN COMPUTER LAB- software previews, electronic bulletin board, etc. Nursing Building

Friday, September 29

7:00 a.m. REGISTRATION Alumni Hall
7:00-8:10 a.m. BUFFET BREAKFAST (price included in registration) Alumni Hall
Interest Groups by Discipline

Tentative Schedule: AMCBT Annual Conference 1995
7:30-12:00 am  FIELD TRIPS I
1. Wehr Nature Center/Mitchell Park (Birding) [$8.00]
2. Cedarburg Bog [$9.00]
3. Boerner Botanical Gardens/Mitchell Park [$8.00]

8:30-12:00 am  FIELD TRIPS II
1. Milwaukee Public Museum [$10.00]
2. Miller Brewery & Jones Island Milorganite Plant - no cost

12:00-1:00 p.m.  OPEN LUNCH

1:00-2:00 p.m.  KEYNOTE ADDRESS  Alumni Hall
Eating the Apple, Knowledge and Responsibility in the Age of Science
John Devereux, GCG Technologies, Madison, WI

2:10-5:00 p.m.  CONCURRENT WORKSHOP SESSION I
1. MACROMEDIA DIRECTOR AS AN AUTHORING TOOL
   Mark Bergland and Karen Klyczek, University of Wisconsin, River Falls
2. PROTEIN AND NUCLEIC ACID ANALYSIS BY COMPUTER AS A TEACHING TOOL IN
   UNDERGRADUATE MOLECULAR BIOLOGY
   Andrew S. Hopkins, Alverno College, Milwaukee, WI
3. USING FYRITE BRAND GAS ANALYSERS TO MEASURE HUMAN METABOLIC RATE
   Mindy Mymudes, Alverno College, Milwaukee, WI

3:25-4:15 p.m.  COFFEE, POSTERS, EXHIBITS  Alumni Hall

4:15-5:00 p.m.  CONCURRENT PAPER SESSION I
1. FRACTAL GEOMETRY IN BIOLOGY
   John R. Jungck, Beloit College, Beloit, WI
2. CONSTRUCTING ONE-PAGE TAXONOMIC KEYS
   Norman Waldow, Maryville University, St. Louis, MO
3. PC MULTIMEDIA TOOLS FOR FIELD BIOLOGY
   Ethel Stanley, Millikin University, Decatur, IL
4. "INSPIRATION": CONCEPT-MAPPING SOFTWARE TO ASSIST STUDENTS TO COPE WITH INFORMATION OVERLOAD
   Leona Truchan, Alverno College, Milwaukee, WI

5:00-6:00 p.m.  BIOSCENE EDITORIAL BOARD MEETING

6:00-7:00 p.m.  SOCIAL HOUR  Alumni Hall

7:00 p.m.  BANQUET (price included in registration)
8:00 p.m.  BANQUET SPEAKER  
"Methanol Toxicity"  
Janis Eells, Medical College of Wisconsin, Milwaukee, WI

9:00-12:00 midnight  INTERNET WORKSHOP (World Wide Web; CDC, NMFS, THOMAS & governer Home Pages; AMCBT Home Page; etc.) 
Tim Mulkey, Indiana State University, Terre Haute, IN 
Buzz Hoagland, Westfield State College, Westfield, MA

Saturday, September 30

8:00-9:15 a.m.  CONTINENTAL BREAKFEAST  
Interest Groups by Discipline  
Alumni Hall

8:30-10:30 a.m.  BALLOTING  
Alumni Hall

9:20-11:00 a.m.  CONCURRENT WORKSHOP SESSION II  
1. TEACHING HUMAN BIOLOGY: A WORKSHOP FORMAT  
Marc M. Roy and Marion Field Fass, Beloit College, Beloit, WI

2. JUMP-STARTING STUDENT CONCEPT MAPS  
Suzanne L. Martin, Moberly Area Community College, Moberly, MO

3. POWERPOINT: USER-FRIENDLY PRESENTATION GRAPHICS SOFTWARE  
Dianne Y. Bell, Avila College, Kansas City, MO

9:25-10:10 a.m.  CONCURRENT PAPER SESSION II  
1. DOES WRITING ABOUT BIOLOGY ENHANCE LEARNING ABOUT BIOLOGY?  
Randy Moore, The University of Akron, Akron, OH

2. MOLECULAR BIOLOGY AND ON-LINE CURRICULA  
Claire Rinehart, Western Kentucky University, Bowling Green, KY

3. VIRTUAL RESEARCH IN A VIRTUAL LIBRARY  
Arthur Messier, Westfield State College, Westfield, MA

10:10-10:30 a.m.  BREAK

10:30-11:00 a.m.  CONCURRENT PAPER SESSION III  
1. DATA ACQUISITION IN THE PHYSIOLOGY LABORATORY  
Steven H. Mills, Central Missouri State University, Warrensburg, MO

2. DARWIN'S FINCHES AND BEYOND: EVOLUTION AND CONSERVATION BIOLOGY IN THE GALAPAGOS ISLANDS  
David J. Hicks, Manchester College, N. Manchester, IN

3. RESOURCE FOR SCIENCE EDUCATION PROGRAM AT NCSA  
Umesh Thakkar, NCSA Education and Outreach, Champaign, IL

4. SEQUENTIAL USE OF CASE STUDIES TO TEACH INVESTIGATIVE SKILLS AND INTERDISCIPLINARY VIEWS OF SCIENTIFIC QUESTIONS  
Terry L. Derting, Murray State University, Murray, KY
OPENING ADDRESS: MAKING SENSE OF NEW MEDICAL TECHNOLOGIES.
Suzanne Amador, Haverford College, Haverford, PA
Physicians can now diagnose and treat disease using medical physics devices such as ultrasound imaging, computer tomography (CAT) scans, and magnetic resonance imaging (MRI). These exciting new medical technologies provide an excellent tool both for motivating students to study science, and for conveying much basic introductory physics. This talk will explain how one physics department uses medical physics and biophysics in different levels of the curriculum, as a way to interest premedical students and biology majors, and to broaden the training of its own majors.

Workshop Session I
WI.1. MACROMEDIA DIRECTOR AS AN AUTHORING TOOL FOR THE DEVELOPMENT OF EDUCATIONAL SIMULATIONS.
Mark Bergland and Karen Klyczek, University of Wisconsin - River Falls, River Falls, WI
This workshop will enable participants to get first-hand experience with one of the most powerful authoring systems for either the Macintosh or Windows operating systems. After a demonstration of basic techniques, participants will create their own interactive simulations and will discuss ways in which computer simulations can be used to enhance courses which they teach.

WI.2. PROTEIN AND NUCLEIC ACID ANALYSIS BY COMPUTER AS A TEACHING TOOL IN UNDERGRADUATE MOLECULAR BIOLOGY.
Andrew S. Hopkins, Alverno College, Milwaukee, WI
This workshop will explore the utilization of nucleic acid and protein sequence databases to create novel and challenging opportunities for students. Participants will be introduced to methods for accessing, searching and retrieving information from these databases, and to computer analysis of the data. Implementation of this information in laboratory experiments will be covered. Examples will be presented of searches conducted by e-mail through the “Blaster” server at the National Center for Biotechnology Information (NCBI) and of a variety of analyses available with the Genetics Computer Group (GCG) collection of programs. These include: searching for sequence by acquisition number, keywords or specific elements of sequence information; analysis of sequence for specific motifs; generation of multiple sequence alignments; analysis of phylogenetic relationships and generation of phylogenetic trees; downloading of files to a local terminal; generation of maps of restriction endonuclease cleavage. The sequence files contain references to original literature where the methodology of the derivation of the sequence is presented. Students can review this information and learn specific applications of modern techniques to the analysis of human genetic disease. Computer design of Polymerase Chain Reaction (PCR) primers will demonstrate the creation of laboratory experiments where students can; i) acquire and analyze sequence data, ii) design PCR primers to amplify a gene incorporating restriction targets flanking the amplified fragment, iii) clone the amplified DNA into an expression vector, iv) screen and recover recombinants, and v) isolate and characterize the expressed gene product. If participants come with information on particular genes, searches can be conducted to acquire and analyze those sequences.
Concurrent Paper Session I

PI.1. FRACTAL GEOMETRY IN BIOLOGICAL SYSTEMS.
John R. Jungeck, Beloit College, Beloit, WI
Fractal dimensions of 2.73 seem of little use to the average science student or teacher used to Euclidean dimensions; however, such fractal "fantasies" have enormous utility in measuring distinguishing features of a wide variety of biological systems. Fractal mathematics and computer software tools will be illustrated to share the beauty and utility of fractal analyses form the molecular to the morphological level. The aesthetics of "irregular," "misshapen," "fractured," "asymmetric," etc. objects will be elaborated for new appreciations.

PI.3. PC MULTIMEDIA TOOLS FOR FIELD BIOLOGY
Ethel Stanley, Millikin University, Decatur, IL
A visual twig key, introduction to spiders, identification of insect orders, interactive tree map of campus, pre-field trip to Lake Mack, and introduction to plant families are presented as examples of both instructor and student authored programs designed for field investigations. A short demonstration of ToolBook to create a runtime program for the PC using a photoCD will be highlighted.

INTERNET WORKSHOP
Tim Mulkey, Indiana State University, Terre Haute, IN and Buzz Hoagland, Westfield State College, Westfield, MA
This workshop will be divided into two simultaneous sessions where participants will access the Internet and the World Wide Web via PCs or Macintosh Computers. Participants will learn how to establish a PPP and/or SLIP connection to the Internet. Freeware WWW browsers, including Mosaic, Netscape, and ElNet's Web searcher will be used by participants to search the WWW during this late night foray into cyberspace. Cyberjunkies will search ElNet Galaxy, WWW Virtual Library, GNN - Whole Internet Catalog, and Lycos for . . . . Tim and Buzz's favorite WWW sites will be demonstrated and lists of URLs (addresses) for these sites will be made available. We will also attempt to demonstrate the relevance of the WWW to classroom instruction.

Workshop Session II

WII.1. A HANDS-ON, EXPERIMENTAL APPROACH TO TEACHING HUMAN BIOLOGY
Marc M. Roy and Marion Field Fass, Beloit College, Beloit, WI
In order to involve beginning students in the process of science, we redesigned our introductory Human Biology course to focus on question posing, problem solving and communicating about Biology. Participants in this session will experience an abbreviated version of a day in our new Human Biology course, which is now taught in a workshop format. We will first engage the participants in several activities that typify our approach. We will then discuss why we implemented a workshop format for the teaching of human biology, our goals and strategies for the course, and the results of the first year. Participants are encouraged to share ideas for the improvement of the course.

WII.2. JUMP-STARTING STUDENT CONCEPT MAPS
Suzanne L. Martin, Moberly Area Community College, Moberly, MO
Concept maps are diagrams consisting of concepts (terms) connected by explicit relationships (links). Participants in this workshop will construct and analyze concept maps in cooperative activities which they can adapt for their own students. Building concept maps helps students acquire strategies for synthesizing, retaining, and applying information. Students working alone often resist learning to build maps because they have trouble getting started. Interaction with peers and the instructor overcomes resistance by helping the students determine the relative significance of concepts and construct meaningful relationships. The workshop includes guidelines for using maps and student-generated examples.

WII.3. POWERPOINT: USER-FRIENDLY PRESENTATION GRAPHICS SOFTWARE
Dianne Y. Bell, Avila College, Kansas City, MO
Presentation software may be used to produce professional-looking slides, overheads, and handouts for the classroom. One popular and user-friendly package is PowerPoint, a Microsoft product which may be purchased separately or as a part of the MSOffice package. PowerPoint contains over 100 professionally-designed templates which can be used to quickly produce
slides, overheads, outlines, speaker's notes and handouts, all in full color or black and white. Clipart from its extensive catalog or from other commercially available packages, text, spreadsheets, and graphs can be imported from external sources. A lecture prepared in PowerPoint converts readily into student handouts. Workshop participants will learn the basics of creating a presentation in PowerPoint, including how to customize, import artwork, and prepare overheads and handouts. Each person or small group will prepare a short PowerPoint sampler and present it to the workshop. All participants will receive a diskette with their sampler, the workshop slides, and a Runtime version of PowerPoint.

Concurrent Paper Session II

PIII.1. DOES WRITING ABOUT BIOLOGY ENHANCE LEARNING ABOUT BIOLOGY?
Randy Moore, The University of Akron, Akron, OH
Many biologists use writing to help enhance students' ability to write and learn about biology. This teaching strategy comes at a "cost" namely, the time required to grade the term papers, essays, etc. associated with a writing-intensive course. But does all this writing really enhance learning? In this talk, I will summarize the results of ongoing studies of the use of writing as a tool for teaching biology. Specifically, I will discuss the importance of teaching students to write effectively about biology, the "costs" and benefits of using writing to teach biology, how to teach students to use writing as a tool for learning biology, and how to handle the paperwork associated with writing to learn biology. I hope to convince you that 1) much of what students write about biology does not enhance learning about biology, and 2) writing about biology enhances learning only when students first understand how to use writing as a tool for learning. The approach that I will advocate differs significantly from that of a typical "writing intensive" course.

PIII.2. MOLECULAR BIOLOGY AND ON-LINE CURRICULA
Claire A. Rinehart, Western Kentucky University, Bowling Green, KY
Example of molecular biology course materials distributed over the World Wide Web for use in lectures and in out-of-class student reviews. Demonstrates how various media and program types can be integrated into a coherent hypermedia package. Shows advantages of providing links to current on-line resources.

PIII.3. VIRTUAL RESEARCH IN A VIRTUAL LIBRARY
Arthur Messier, Westfield State College, Westfield, MA
So, your campus finally established a connection to the Internet, or you took out a second mortgage on your home and purchased a computer with a modem because new astro-turf was needed for the Administration's indoor putting green. You turn on the ignition switch, watch the lights in the neighborhood grow dim, and feel the awesome power as your machine inches it's way onto the Information Superhighway. Watchout, packets of 8 bits at parity are zooming by at 56,000 bps! It is dangerous out here in cyberspace. The roads signs, when present, are written in cyberspeak.

However, after much frustration and more patience than was required for meeting the margin requirements of the Graduate College, you finally arrive at your destination, Big Midwestern University Library to begin your search. Thirty minutes later, after traveling the beltway with no recognizable exit signs, you give up and go home. What happened?

Searching the World Wide Web can be tedious at best and frustrating or a pain in the . . . at worst. Often when you find a site that sounds like it could be the Holy Grail, you type in the URL only to find that it is not available at this time. On those occasions when you do connect, you find that the system was designed for insiders and outside cyberspunks, which you are not. The frustrations and successes of a Head Reference Librarian, at a small undergraduate liberal arts college, assisting undergraduates conduct research via the Internet will be discussed.

Concurrent Paper Session III

PIII.1. DATA ACQUISITION IN THE PHYSIOLOGY LABORATORY
Steven H, Mills, Central Missouri State University, Warrensburg, MO
Two computer data acquisition systems (CDAS) have been used by Animal Physiology students for comparison to chart recording systems. Nearly all students rated their experience with computers as a novice or intermediate while about half of the students had previous experience with Macintosh computers. Students compared two systems (MacScope and MacLab) with nearly all
rating both as useful or very useful compared to the "physiograph" chart recorders. Both CDAS were found to be more convenient and easier to use in preparing lab reports. Requested instructions for using the CADS were made available on HyperCard which are immediately available as the MacLab CADS is used. "On-line" processing of data (i.e., data stream averaging) makes recording of evoked potentials possible in "noisy" laboratories without electronic filters or "noise" isolation devices. Network connection to all recording stations to a file server not only simplifies retrieval, evaluation, and compiling of data, but also permits analysis of the compiled data via the campus network on a 24-hour basis. Support was provided by the National Science Foundation's Division of Undergraduate Education through grant DUE-#9452535.

PIII.2. DARWIN'S FINCHES AND BEYOND: EVOLUTION AND CONSERVATION BIOLOGY IN THE GALÁPAGOS ISLANDS
David J. Hicks, Manchester College, N. Manchester, IN
Despite more than a century and a half of research since Darwin's visit, the Galápagos continue to provide inspiration for research. Some recent studies of speciation and evolutionary radiation of plant and animal groups will be reviewed. Despite the protected status of the archipelago, the native biota faces strong impacts from human activities, and these will also be discussed.

PIII.3. RESOURCE FOR SCIENCE EDUCATION PROGRAM AT NCSA
Umesh Thakkar, National Center for Supercomputer Applications Education and Outreach, Champaign, IL
The Resource for Science Education (RSE) program is intended to foster the development, by visiting educators working with NCSA staff and researchers, of curricula, programs of study, course modules, software, publications, and/or strategies that enhance and increase the use of visualization and networking methodologies in education. The goals of the RSE Program are: 1) discussion, dissemination, implementation, and evaluation of the uses of high performance computing in science and technology education; 2) exchange of ideas on software and network access needs for computational science education between researchers, educators and students; 3) collection and distribution of high performance computing educational strategies and programs; 4) raising awareness of and providing training in high performance computing and communications (HPCC) tools and techniques for interested educators and their organizations; and 5) development of collaborative proposals to develop resources that facilitate discovery-based learning and teaching.

PIII.4. SEQUENTIAL USE OF CASE STUDIES TO TEACH INVESTIGATIVE SKILLS AND INTERDISCIPLINARY VIEWS OF SCIENTIFIC QUESTIONS
Terry L. Derling, Murray State University, Murray, KY
Case studies have become an increasingly popular teaching tool. Most frequently, the cases studies published for use in biology courses are a series of independent scenarios with or without a set of discussion questions. I will present a teaching method in which related case studies are used sequentially; thereby stimulating more in-depth thinking and critical evaluation by students than the use of isolated cases. Using sets of related case studies students can gain insight into key similarities and differences among related scientific problems and the complex relationship between science, economy, cultural history, etc.