

Educational and Scientific Workshops

Please read the Refund and Cancellation Policy. Workshops are ticketed events; tickets may be purchased while registering and will be included in the registration packet. If you participate in a Workshop(s) before acquiring your registration packet, bring your registration confirmation notice so that you have a record of your purchased ticket. All workshops will be held in the Cliff Lodge on Sunday, August 1, at Snowbird at a location to be announced.

Half Day - Morning

W-1 Using LabWrite: An Online Guide to Helping Students Write Lab Reports\$35.00

Time: 8 am - 12 pm

Presenters: James E. Mickle, Department of Botany, Box 7612, North Carolina State University, Raleigh, NC 27695 Phone: (919) 515-9050, Fax: (919) 515-7519, E-mail: james_mickle@ncsu.edu.

Michael Carter, Department of English, Box 8105, North Carolina State University, Raleigh, NC 27695, Phone: (919) 515-4120, Fax: (919) 515-6071, E-mail: michael_carter@ncsu.edu.

Eric Wiebe, Department of Math, Science, and Technology Education, Box 7801, North Carolina State University, Raleigh, NC 27695, Phone: (919) 515-1753, Fax: (919) 515-6892, E-mail: eric_wiebe@ncsu.edu.

Attendance Limit: 16

Target Audience: Undergraduate/Graduate

LabWrite is a structured set of online materials developed as an alternative to the typical lab report instruction—a page or two listing the parts of the report. LabWrite provides extensive resources designed to lead college students through the entire lab experience, beginning with questions that help students to comprehend the essential elements of the lab before they start the procedure and ending with advice for improving their performance on the next lab report. The primary goal of LabWrite is to better enable students to take advantage of the potential that writing lab reports offers for learning science. In a control-group study of students in the biological sciences, those using LabWrite demonstrated significantly greater understanding of the science of the labs and a greater ability to apply formal scientific reasoning to the labs than students receiving the typical instruction in writing lab reports. This workshop is an introduction to using LabWrite. By the end of the workshop, participants will have all the information and materials they need to incorporate LabWrite in their lab classes (LabWrite is fully accessible on the Web and costs nothing to use). The introduction consists of a review of the background and development of LabWrite and studies of LabWrite in the biological sciences, an overview of the website, a demonstration of how it is used, hands-on activities using the site, and guidance on incorporating the LabWrite materials effectively in lab classes. LabWrite is funded by the National Science Foundation.



W-2 Building the Tree of Life\$20.00

Time: 8 am - 12 pm

Presenters: Brent D. Mishler, University and Jepson Herbaria, 1001 Valley Life Sciences Building #2465, University of California, Berkeley, 94720, Phone:(510)642-6810,Fax:(510)643-5390,Email: bmishler@socrates.berkeley.edu.

Kirsten M. Fisher, Department of Integrative Biology, 3060 Valley Life Sciences Building, University of California, Berkeley, 94720, Phone: (510) 643-9556, Fax: (510) 643-5390, E-mail: kirstenj@socrates.berkeley.edu.

Attendance Limit: 50

Target Audience: High-school and Introductory Undergraduate Biology teachers



Reconstructing the tree of life is evolutionary biology's greatest challenge. This workshop will provide an introduction the concepts behind "tree thinking" and phylogenetic principles, and will review our most current understanding of the overall tree of life. We will introduce the basic methods of phylogenetic analysis and conduct a hands-on demonstration of a classroom exercise appropriate for grades 9-12 and introductory university level biology classes. The workshop will also introduce the general principles behind the algorithms that are used to build phylogenetic trees in computer analyses, and will provide an interactive demonstration of computer-based tree reconstruction. These exercises will provide the basis for understanding the principles behind reconstructing the tree of life, and we will discuss the practical importance of understanding the evolutionary relationships of organisms.

Sponsored by three National Science Foundation supported projects:

- CIPRES - <http://landscape.sdsc.edu:8080/CIPRES>)
- The Green Tree of Life - <http://ucjeps.berkeley.edu/TreeofLife/>
- Deep Gene - <http://ucjeps.herb.berkeley.edu/bryolab/deepgene/index.html>)



2-Hour Morning

W-3 Measuring Wood Porosity for Ecological Laboratories \$20.00

Time: 10 am - 12 pm

Presenter: Stanley Rice, Biological Sciences, Southeastern Oklahoma State University, Durant OK 74701-0609, Phone: 580-745-2688, E-mail: srice@sosu.edu.

Attendance Limit: 20

Target Audience: Undergraduate Laboratories

Early successional trees grow faster than late successional trees, and may therefore require more water. We would therefore expect that the wood of early successional trees would have greater porosity. This hypothesis can be tested in the undergraduate laboratory. Participants in this workshop will estimate porosity from microscopic observation of wood of different species, and analyze the results. This activity can be modified to suit individual classes; for example, it can include an outdoor component.

2-Hour Afternoon

W-4 Developing Your Lab Curriculum Materials Using Resources from the University of Wisconsin \$35.00

Time: 1 pm - 3 pm

Presenter: Michael Clayton, University of Wisconsin - Madison , 430 Lincoln Dr., Madison, WI 53706, E-mail: clayton@wisc.edu.

Attendance Limit: 24

Target Audience: College undergraduate and high school educators

Developing a lab curriculum from scratch is laborious, and simply adopting a lab manual can be restrictive. Materials developed at U.W.-Madison, may be adopted by you for a nominal fee. These include lab topics, image collections that reflect these topics, and web lessons. The lab topics may be used, "as is" or rewritten to better reflect your educational goals. They include graphics that may also be used as you wish in your own set of lab topics. The web lessons may also be copied and modified as you see fit. In this workshop I will demonstrate the materials available to fellow educators, and how they address specific learning objectives in the context of our introductory botany course. Many of these materials are available as reference materials through our server at <http://botit.botany.wisc.edu/>



W-5 Creating Digital Video \$20.00

Time: 1 pm - 3 pm

Presenter: Steven J. Wolf, Department of Biological Sciences, California State University Stanislaus, Turlock, CA 95380. Ph. (209) 667-3489, Fax: (209) 667-3694. Email swolf@arnica.csustan.edu.

Attendance Limit: 50

Target Audience: Undergraduate/Graduate

Creating digital video on a personal computer is a relatively straightforward process and it can be done on virtually any modern personal computer. Video may be captured via an analog capture board or, more preferably, a digital firewire (1394) port. Regardless of platform, all video editing software works the same way. Captured video, still images and/or audio is combined on a timeline or storyboard; text, titles, special effects, and transitions between scenes are added; and the resultant video is output to an appropriate file format. The video may also be output back to digital tape for DVD quality television viewing. Through a lecture format the presenter will discuss hardware and software requirements, from low end to high end, for creating digital video; what file formats are appropriate depending on intended use; and he will also demonstrate video capture and the creation of a digital video using both low end and high end software. He will also demonstrate how to combine still images with text and narrations to produce instructional videos.

W-6 Implementation and Utility of Digital Microscopy in the Laboratory Environment \$20.00

Time: 3 pm - 5 pm

Presenters: Bruce Robart, Department of Biology, The University of Pittsburgh at Johnstown, Johnstown, PA 15904, Phone: (814) 269-2911, E-mail: robart@pitt.edu.

Kim Ziance, Department of Biology, The University of Pittsburgh at Johnstown, Johnstown, PA 15904, Phone: (814) 269-2917, E-mail: kziance@pitt.edu.

Attendance Limit: 25

Target Audience: Faculty/Graduate students & Junior High School/High School Teachers

Digital microscopy combines the magnification ability of a light microscope with the image capture capability of a digital camera. The nearly instantaneous capture of images greatly improves the immediacy between concept and reality allowing instructors to forge this connection in real-time. With traditional optical microscopes, this connection is often lost because instructor and student cannot

simultaneously view and discuss the object; hence important details are often missed or lost in translation. Students can also capture images to enhance laboratory reports, develop digital notebooks, or document biological phenomenon for research. In this workshop we will cover the types of digital equipment available, their setup, and how we use the equipment in both a lecture and laboratory environment. Student projects will be showcased and the pedagogical merit and evaluation of such exercises will be discussed. Several kinds of digital microscopes will be available for demonstration.



Half-Day Afternoon

W-7 Content Enrichment in Investigative Labs: A Solution to the Perceived Tradeoff Between Quantity and Quality\$35.00

Time: 1 pm - 5 pm

Presenter: Staria S. Vanderpool, Department of Biological Sciences, Arkansas State University, State University, AR 72467, Phone: (870) 972-3082, Fax: (870) 972-2638, Email: svand@astate.edu.

Attendance Limit: 24

Target Audience: Undergraduate/Graduate Faculty and Students

Many science educators develop an interest in investigative labs in biology, but then choose a traditional lab format because of the perception of the time commitment for students to analyze a problem, then plan and conduct their investigations in the traditional lab framework. As I planned the switch from confirmatory, weekly labs to a multi-week investigative format I shared this commonly expressed concern. Because we considered the hands-on investigative format of the lab experience to be a crucial validation of the inclusion of labs in a

science curriculum we chose to proceed with development of an investigative curriculum. As I developed the labs I adopted a unit perspective focusing on key concepts in freshman biology. One outcome was the reduction in the number of units, with each unit requiring two to four lab periods to complete. However, development of each unit led to a process that I called 'layering'. 'Layered' units focused on key topics in biology (energy, genetics, evolution), and then integrated multiple concepts under the umbrella of a key topic. As an example the unit on inheritance now includes classical human genetics, molecular genetics sexual reproduction and forensics. Organization of each unit includes placing the most intensive concepts and research assignments at the several related experiments, culminating in concluding requirements that ask them to link concepts and results from all parts of the unit that ask them to link concepts and results from all parts of the unit to the original biological questions. Inclusion of side, or subsidiary components of the topic means that students have no downtime during the unit as they wait for results from their primary investigations. Design of the layered units contributes to student integration of linked topics in biology and curricular enrichment of the investigative lab format.

