Friday, May 17

7:00am – 7:45am  Pre-Conference Workshop Attendee Conference Check-In  Lobby Heritage Center

8:00 – 11:30am  Pre-Conference Workshops

**Workshop 1**
Emerging Issues in Education: Active Learning in the Classroom
Sue Merkel, Cornell University, Ithaca, NY

**Workshop 2**
Bioinformatics
Stuart Brown, New York University, New York, NY

**Workshop 3**
NIH & NSF Grant Writing Workshop
Celeste Carter, National Science Foundation, Arlington, VA
Adolphus Toliver & Hinda Zlotnik, National Institutes of Health, Bethesda, MD

10:00am – 5:00pm  Conference Check-In  Lobby Heritage Center

11:30am  Orientation Meeting for Friday afternoon Group Leaders  Lobby Heritage Center

11:30am – 1:00pm  Lunch  Heritage Center

1:00 – 2:00pm  Plenary Session 1
Emerging Issues in Microbial Biodiversity
Julian Davies, University of British Columbia, British Columbia, Canada

2:00 – 2:15  Break  PB Foyer

2:15 – 3:15pm  Plenary Session 2
Bioterrorism
Ron Atlas, University of Louisville, Louisville, KY

3:15 – 3:30pm  Break  PB Foyer

3:30 – 5:30pm  Discussion Group Sessions
Mandatory Sharing of Best Practices and Problems in Teaching Emerging Issues
M. Frances Hite, Louisiana State University, New Orleans, LA
Indiren Pillay, Southwest Tennessee Community College, Memphis TN

6:00 – 7:00pm  Dinner  Heritage Center

7:00pm  First Bus to Salt Lake City Marriott – University Park  Heritage Center
(bus will depart from the Heritage Center)
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7:30 – 7:45pm  Best Practices and Solutions to Problems Summary  MUP Bonneville Ballroom

7:45 – 9:00pm  A Creative Approach to Best Practices  MUP Bonneville Ballroom
    Helen Davies, University of Pennsylvania, Philadelphia, PA

9:00pm  Reception  MUP Bonneville Ballroom

11:15pm  Last Bus back to Heritage Center

Saturday, May 18

7:00 – 8:00am  Breakfast

8:30 – 9:20am  Plenary Session 3  PB Auditorium
    Implementing Science Teaching Reform Methods:
    I. Developing a Strategy
    Maria Harper Marinick and Jeff Pommerville
    Maricopa Community College, Tempe, AZ

9:20 – 9:35am  Break  PB Foyer

9:35 – 10:30am  Plenary Session 4  PB Auditorium
    Implementing Science Teaching Reform Methods:
    II. Assessing the Impact
    Eugene Judson, Arizona State University, Tempe AZ

10:30 – 10:45am  Break  PB Foyer

10:45 – 12 Noon  Concurrent Sessions
    (All seven sessions repeat at 1:45pm today)

CS1  Using the ASM Video Telecourse: Unseen Life on Earth:  PB Room 250
    An Introduction to its use in Teaching Microbiology
    Spencer Benson, University of Maryland College Park,
    College Park, MD
    Joanna Verran, Manchester Metropolitan University,
    Manchester, United Kingdom

CS2  Microbes Count: Hands-on Workshop Using BioQuest  Sage Point
    Activities for Introductory and Intermediate Microbiology
    Education
    Marion Fass, Beloit College, WI

CS3  Using Curriculum Resources for ASM’s MicrobeLibrary:  PB Auditorium
    Actual Experiences and Factors to Consider
    Angie Alexander, Pacific Lutheran University, Tacoma, WA
    Tom Terry, University of Connecticut, Storrs, CT

CS4  Role of the Science Professional in K-12 Education  PB Room 104
    Monroe Duboise, University of Southern Maine, Portland, ME

CS5  Laboratory Skills for Students Majoring in Microbiology  NB Room 214
    Neil Baker, The Ohio State University, Columbus, OH
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CS6  Teaching Bioethics  PB Room 316
Amy Vollmer, Swarthmore College, Swarthmore, PA

CS7  Do You Know Where York Teaching Assistants (TAs) are:
Safety Training in the Microbiology Laboratory  NB 201
Erica Suchman, Colorado State University, Fort Collins, CO

12:30 – 1:30pm  Lunch  Heritage Center

12:30 – 5:50pm  Poster Set-up (See page 5 for assignment location)  FDOC

1:45 – 3:00pm  Concurrent Session (Repeat)
(please see listing at 10:45am for room locations)

3:00 – 3:15pm  Break  PB Foyer

3:15 – 4:15pm  Plenary Session 5  PB Auditorium
Microbiological Concepts Explained Using Examples from
Deep-Terrestrial Hydrothermal Ecosystems
Anna Louise Reysenbach, Portland State University

4:30 – 5:30pm  Open Discussion / Networking Time

4:30 – 9:00pm  Exhibits Open  FDOC

5:30 – 7:00pm  Dinner  FDOC

7:00 – 9:00pm  Poster Session (See page 5 for abstract location)  FDOC

9:00pm  First Bus to Salt Lake City Marriott
(bus will depart from the FDOC)

9:00pm  Reception  MUP Bonneville Ballroom

12:00am  Last bus back to the Heritage Center
(bus will depart outside the Hotel Lobby)

Sunday, May 19

7:00 – 8:00am  Breakfast

8:30 – 9:30am  Plenary Session 6  PB Auditorium
Active Learning in the Microbiology Classroom
Charles Bonwell, Active Learning Workshops, Green Mt. Falls, CO

9:30 – 9:45am  Break  PB Foyer

9:45 – 10:15am  Update and Feedback on Curriculum Recommendations  PB Auditorium
Neil Baker, The Ohio State University, Columbus, OH
10:15 – 11:00am  **Concluding Remarks**  
Indiren Pillay, Southwest Tennessee Community College, Memphis TN  
M. Frances Hite, Louisiana State University, New Orleans, LA  
PB Auditorium

11:30am  **Adjournment**

12:00 Noon  **Lunch Pick-up**

12:30pm  **First Bus to General Meeting**  
(bus will depart from Heritage Center)

1:30pm  **Last Bus to General Meeting**  
(bus will depart from Heritage Center)
Friday, May 17th

Pre-Conference Workshops, 8:00 AM – 11:30 PM (optional: separate registration required):

1. Emerging Issues in Education: Active Learning in the Classroom
   Sue Merkel, Cornell University, Ithaca, NY
   
   The purpose of this workshop is to give attendees exposure to a wide variety of ways active learning can be used in microbiology classrooms, with special emphasis given to using active learning within the lecture format. In the first part of the workshop, we will examine and modify existing activities. In the second part, we will develop new active learning materials based on topics that participants choose. After this workshop, participants should feel comfortable developing and using active learning activities in their own classrooms.

2. Bioinformatics
   Stuart Brown, New York University, New York, NY
   
   Bioinformatics is the application of computational and information sciences to biological data. With the recent explosion of genome sequence data, the use of Bioinformatics tools is becoming ever more fundamental to the routine work of biologists and biomedical professionals. Therefore Bioinformatics is being taught at ever earlier points in the curriculum. This workshop will familiarize undergraduate faculty with the basic areas of Bioinformatics (similarity, alignment, fragment or EST assembly, genome databases, gene expression), provide a model syllabus for an undergraduate course, demonstrate some sample exercises to familiarize students with Bioinformatics tools, and suggest online resources for further self-directed learning.

3. NIH & NSF Grant Writing Workshop
   Celeste Carter, National Science Foundation, Arlington VA
   Adolphus Toliver and Hinda Zlotnik, National Institutes of Health, Bethesda, MD
   
   This workshop will provide an overview of the NSF and NIH funding agencies to allow participants to learn more about program opportunities for undergraduate institutions, students, and faculty and to determine which agency is more appropriate for their needs. Following an introductory session, participants will choose which
focus group to attend to delve into the details of specific programs. Presenters will address grant writing procedures and processes, evaluation and review of proposals, timelines, and other details to help participants learn both how to find a program to match initiatives and to develop a targeted proposal to secure funding.

**Opening Plenary Sessions, 1 – 3:15 PM:**

1. **Emerging Issues in Microbial Biodiversity**  
   Julian Davies, University of British Columbia, British Columbia, Canada  
   There is little doubt that microbial diversity is one of the remaining frontiers of life on earth to be explored. This is paradoxical in the sense that all living organisms require microbes to survive. The microbial population in the biosphere is large in numbers, variety, and function. At present, 99% of the bacterial inhabitants of the earth are unknown. How many genera and species remain to be discovered? New approaches to the analysis of microbial populations will be needed before humankind can begin to decipher the nature of the microbial world. There is a great future to microbiology!

2. **Bioterrorism**  
   Ron Atlas, University of Louisville, Louisville, KY  
   This session will cover the recent anthrax bioterrorist attack as well as the other potential biothreat agents. It will deal the detection and response issues and public health preparedness, including the laws and regulations aimed at deterring bioterrorism. Further, the role of microbiologists and strategies for teaching the topic of bioterrorism will be discussed.

**Small Group Activity, 3:30 – 5:30 PM:**

**Discussion Group Activity**  
Group Leaders and Groups of six persons will be identified. Groups will be organized by interest, type of student audiences, and class size. During this small group session, participants will be encouraged to share their "best practices and problems" in teaching emerging issues.

**Evening Session, 7:45 – 9 PM:**

1. **A Creative Approach to Best Practices**  
   Helen Davies, University of Pennsylvania, Philadelphia, PA  
   Dr. Helen Davies, University of Pennsylvania professor, former big-band song lady, and winner of last year's National Golden Apple Award for Teaching Excellence will present a light-hearted (...but deadly serious!) Medical Microbiology sing-along. The presentation will include such familiar tunes as "Hello, Herpes, Our Old Friend" and "Leprosy" ("...bits and pieces falling off of me"). Her personal warmth will charm you, and her words will ring in your ears for years to come.
Saturday, May 18th

Plenary Sessions, 8:30 –10:30 AM:

1. Implementing Science Teaching Reform Methods: I. Developing a Strategy
   Jeff Pommerville and Maria Harper Marinick, Maricopa Community Colleges, Tempe, AZ

   Over the past several years there has been increasing attention focused on a paradigm shift in undergraduate science education and microbiology education. This shift has been from a teacher-centered environment where information is "delivered" to students to a learner-centered environment in which students are "active" learners. In this first session, we will define an active learning environment. We will then explore the following issues: the role of the teacher, fostering a safe learning environment, setting and meeting classroom goals, and facilitating student participation.

   After attending this session, participants will be able to: 1) Describe the critical factors that contribute to a successful active learning environment; and 2) Design learning opportunities that promote student active engagement.

2. Implementing Science Teaching Reform Methods: II. Assessing the Impact
   Eugene Judson, Arizona State University, Tempe AZ

   In making the transition to a reformed classroom or laboratory, how do you know the transition has begun; that is, how do you know you are transforming your students into active learners? In the second part of this morning’s sessions, participants will be introduced to the elements of assessing reformed science instruction. By observing videotaped class sessions and using a Reformed Teaching Observation Protocol (RTOP), participants will gain insight into the dimensions considered pertinent when evaluating instruction. The intent will be to look beyond cursory indicators such as group work and examine authentic classroom interaction.

Concurrent Sessions, 10:45 – 12:00 Noon (each session repeats at 1:45 PM):

1. Using the ASM Video Telecourse: Unseen Life on Earth: An Introduction to its Use in Teaching Microbiology
   Joanna Verran, Manchester Metropolitan University, Manchester, United Kingdom
   Spencer Benson, University of Maryland College Park, College Park, MD

   The presentation will highlight some of the adventitious attributes of the series and how we have used the series in helping students learn core concepts in Microbiology. The presentation will provide perspectives from both the US and England. A discussion of how participants have or might use the series will be part of the session. The session is directed at helping faculty who are thinking about using the series in their classes and as a forum for sharing lessons learned in use of the videos in a variety of class settings.
Marion Fass, Beloit College, Beloit, WI

In this workshop, participants will have the opportunity to use several of the investigative, quantitative, computer-based laboratory experiences from Microbes Count, the BioQUEST Curriculum Consortium's collection of microbiology activities. These activities are designed to enable students to move from concepts to applications and from abstractions to real world problems. Activities can be adapted for distance education.

3. Using Curriculum Resources from ASM’s Microbe Library: Actual Experiences and Factors to Consider
Angie Alexander, Pacific Lutheran University, Tacoma, WA
Tom Terry, University of Connecticut, Storrs, CT

The ASM MicrobeLibrary has by now published around 40 curriculum activities, some for us in lecture/discussion sessions, some for use in the laboratory. Factors such as time, space, nature of student groups, and budget (as well as other issues) may color our choices of which activities to adopt in our own classrooms. In this session we invite people who have used activities from the collection to share their experiences and those who have questions about implementing the activities to pose those questions. In order to refer to the details of activities that we discuss, we will be equipped to access the activities on-line. The objectives for this session are that the participants become aware of the specific experiences of others in using these activities and develop a sense of how well the activities might work in various pedagogical situations.

4. Role of the Science Professional in K-12 Education
Monroe Duboise, University of Southern Maine, Portland, ME

K-12 science teachers provide much dedicated effort typically in isolation from most of the scientific community and with very limited resources. There are a variety of effective roles through which science professionals at colleges, universities, and other such institutes can bridge the communication divide and work together with K-12 science educators to enrich K-12 education. Most university educators find few incentives to involve themselves in K-12 outreach activities, but initiatives of the National Science Foundation and others provide opportunities that can allow K-12 outreach to be a rewarding part of the careers of scientists at colleges and universities. This session will highlight some of these opportunities and will survey several partnerships of scientists and high school educators in Maine.

5. Laboratory Skills for Students Majoring in Microbiology
Neil Baker, The Ohio State University, Columbus, OH

Curriculum guidelines for Microbiology majors have been proposed and seem to have been well received. Five courses each with its own lab are recommended for core courses, but the recommendations for lab skills does not extend much beyond what
has been established as the skills needed for a student completing an introductory Microbiology course. What additional lab skills does a student majoring in Microbiology need? Specifically, what are the main skills that should be taught in the labs that accompany the Microbial Physiology, Microbial Genetics, and Microbial Diversity courses? Participants attending this session will work to compile a list of skills that are unique to these courses and should be acquired by all students majoring in Microbiology. Thus this session will be of most interest to faculty who are teaching at institutions that have a major program in Microbiology. Whether or not you plan to attend this session, please forward any recommendations you may have regarding lab skills for microbiology majors to me prior to the meeting. I will summarize these before the session so that we will be able to finalize them. Send your recommendations to me at baker.2@osu.edu. If you do not have the time to draft a list, forward a copy of the lab syllabus for any similar courses offered at your institution.

6. Teaching Bioethics
   Amy Vollmer, Swarthmore College, Swarthmore, PA

   Teaching Bioethics can be done in a number of ways: Within a microbiology course, within a biotechnology course, within a general or introductory biology course, as a stand-alone offering. We will explore lecture and discussion topics, assignments. We hope to open up an exchange of ideas and concerns with colleagues from many different institutions who teach a diverse student population.

7. Do You Know Where Your Teaching Assistants (TAs) Are: Safety and Training in the Microbiology Laboratory
   Erica Suchman, Colorado State University, Fort Collins, CO

   During this session we will explore training of graduate teaching assistants for teaching in microbiology laboratories. I will describe the training program at Colorado State University as a possible model. Then the group as a whole will discuss what information we believe every microbiology teaching assistant should have before entering the laboratory to teach.

Plenary Sessions, 3:15 – 4:15 PM:

1. Microbiological Concepts Explained Using Examples From Deep-Sea Terrestrial Hydrothermal Ecosystems
   Anna Louise Reysenbach, Portland State University, Portland, OR

   Exploring the diversity, physiology and ecology of microbes can be effectively done drawing from examples of research done in both deep-sea and terrestrial hydrothermal systems. These include exploring, early evolution of life on Earth, how microbes play fundamental roles in biogeochemical cycling, geomicrobiological interactions, symbiotic relationships, stress responses, thermophily, chemolithoautotrophy, how molecular phylogenetic approaches for studying diversity have provided a new window into the microbial world and assisted in growing some
of the 'as yet' unculturables. Furthermore these ecosystems have provided models for studying evidence for life on other planets as they represent some of the extremes at which life can exist. In my talk, I will show how in my teaching of microbiology, I use examples from hydrothermal ecosystems to illustrate specific concepts in microbiology.

**Open Discussion and Networking Time, 4:30 – 5:30 PM:**

Take this opportunity to meet with fellow colleagues to discuss today's sessions.

**Exhibits, 4:30 – 9 PM:**

Exhibitors representing educational resource companies and organizations are available to discuss their products and services.

**Poster Sessions, 7 – 9 PM:**

Two hour long sessions for poster presenters to share their research results in teaching and learning microbiology.

**Sunday, May 20th**

**Plenary Session, 8:30 – 9:30 AM:**

1. **Active Learning in the Microbiology Classroom**
   Charles Bonwell, Active Learning Workshops, Green Mt. Falls, CO

   At the 1996 Undergraduate Microbiology Education Conference, we explored the basics of active learning and developed innovative strategies for microbiology classrooms. Since all instructors want students to become proficient at thinking logically, solving problems and making decisions, this presentation will focus on using active learning to develop students’ thinking skills in a science classroom. Specifically, this workshop will explore: 1) A brief review of active learning research; 2) Teaching thinking skills explicitly using active learning; and 3) How questioning can promote thoughtful thinking. It is a basic assumption of active learning that everyone has something to contribute—so please come join us!

**Discussion, Evaluation, and Feedback, 9:30 – 11 AM:**

1. **Update and Feedback on Curriculum Recommendations**
   Neil Baker, The Ohio State University, Columbus, OH

**Wrap-Up, 11 AM**

**Adjournment, 11:30 AM**