

1994

78th Annual Meeting, 1994. Program

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PROGRAM

Arkansas Academy of Science

Seventy-Eighth Annual Meeting
April 8-9, 1994
Arkansas State University

SCHEDULE OF EVENTS

Friday, 8 April 1994

10:00 - 14:00	Registration	LS Lobby
09:00 - 11:00	Executive Committee	LS 441
11:00 - 17:00	Exhibits	LS 433
11:30 - 12:30	First Business Meeting	LS 219
15:00 - 15:30	Refreshments	LS 441
11:30 - 17:00	Slide Preview	LS 442
PAPER SESSIONS		
13:30 - 17:15	Chemistry	LS 203
13:30 - 17:00	Botany	LS 204
13:30 - 16:45	Biomedical	LS 205
13:30 - 15:00	Herpetology	LS 206
15:45 - 17:00	Invertebrate Zoology	LS 206
13:30 - 17:15	Physics/Computers/ Energy/Geology	LS 207
13:30 - 17:15	Aquatic Biology	LS 444
17:30 - 18:15	Tours**	See page 2
17:30 - 18:30	Mixer	Alumni Lounge
18:30	Banquet	Ball Room Reng Center
19:45	Speaker:	

Dr. Ken N. Paige - University of Illinois
"Plant - Animal Interactions and the Dynamic Nature of Plants"

Saturday, 9 April 1994

07:45 - 11:00	Slide Preview	LS 442
08:00 - 10:00	Registration	LS Lobby
08:00 - 13:00	Exhibits	LS 433
07:45 - 08:15; 09:45 - 10:00	Refreshments	LS 441
12:00 - 13:00	Second Business Meeting/ Awards	LS 219
14:00	Biology Department Chairs Meeting	TBA
PAPER SESSIONS		
08:15 - 10:30	Chemistry	LS 203
08:15 - 11:15	Geology/Astronomy/Physics	LS 204
08:15 - 10:30	Microbiology/Cell Biology	LS 205
08:15 - 11:45	Ecology/Conservation	LS 344
08:30 - 09:30	Science Education Toxicology/Water Quality	LS 207
08:15 - 11:45	Birds/Mammals	LS 444

**FRIDAY TOURS

Aquatic Ecotoxicology Research Facility	Meet in LS Lobby
Aquatic Macro-Invertebrate Laboratory & Museum	LSE 304
Cell Biology Laboratory	LSW 545
Electron Microscopy Laboratory	LSW 109
GIS Laboratory	LSW 443
Herbarium	LSE 406
Herpetology Museum	LSW 440
Mammal Range	LSW 439
Physiology Research Laboratory	LSE 302
Toxicology Research Laboratory	LSW 544

For tours at different times than scheduled, contact Phoebe A. Harp.

SECTION PROGRAMS

*Undergrad

**Grad Students

Friday, April 8, 1994

LS 203

CHEMISTRY

Chair: Dr. Jerry A. Darsey, University of Arkansas at Little Rock.

*Substituted Nitrophenylfurans: Chemistry and Mutagenicities. E. Kim Fifer, Kevin S. Robertson, Robert M. Freeze, University of Arkansas for Medical Sciences at Little Rock, AR, Ali U. Shaikh, University of Arkansas at Little Rock, AR, and J.P. Freeman, National Center for Toxicological Research, Jefferson, AR.

*Conformational Studies of Methyl, Dimethyl and Chloro Derivatives of Dantrolene Using *AB Initio* SCF-MO Procedures. Amber D. Climer, Lori L. Rayburn and Jerry A. Darsey, University of Arkansas at Little Rock, AR.

*Conformational studies of *Ortho* and *Meta*-Nitro Isomers of Dantrolene Using *AB Initio* SCF-MO Procedures. Lori L. Rayburn, Amber D. Climer and Jerry A. Darsey, University of Arkansas at Little Rock, AR.

*Studies of Copper (II) 2-Hydroxy-5N, N-Diethylsulfonamide Benzoate. Elsie Williams, Shaheen Khan, Israt J. Chowdhury and William M. Willingham, University of Arkansas at Pine Bluff, AR.

*Evidence for Copper Complexation of an Oxazolidine Formed From (-) Ephedrine and Salicylaldehyde. Antonie Rice, Lawrence D. Fitz, Gordon L. Eggleton and Richard B. Walker, University of Arkansas at Pine Bluff, AR.

*The Reaction of $CpRu(PPh_3)_2^+$ with Cycloethers. M. Draganjac, Mark Green, Yanjing Jiang, Arkansas State University, State University, AR, and A. W. Cordes, University of Arkansas at Fayetteville, AR.

*Proton-Coupled Electron Transfer Reactions of Ruthenium Pyrazole Complexes. Kevin Stanfield, Sharon Ezell, Spencer Slattery and Kenneth Gloldsby, University of Arkansas at Pine Bluff, AR, and Florida State University, Tallahassee, FL.

Break

Chair: Dr. Susan G. Cady, Arkansas State University

*Hammett Correlations of Half-Wave Reduction Potentials in a Series of N-(ARYL Substituted)-Dichloro Nicotinamides. Cecil C. Persons, Ali U. Shaikh, Julie Shiflett and Frank L. Setiff, University of Arkansas at Little Rock, AR.

*Analysis of Ammunition by X-Ray Fluorescence. Michael W. Rapp and Teddy Townsend, University of Central Arkansas, Conway, AR.

Use of a Cyclodextrin Chromatography Column to Confirm the Resolution of Several D, L. Tryptophan Analogs. Susan Cady, Arkansas State University, State University, AR.

Determination of The Pesticide, 2,4-DP by Room Temperature Phosphorimetry. Lorrie Jenkins and Norman Trautwein, Arkansas State University, State University, AR.

High Surface Area Covalent Metallophosphate Gels. D. A. Linqvist, S. M. Poindexter, S. S. Rooke, D. R. Stockdale, A. L. Smoot, W. E. Young and K. B. Babb, University of Arkansas at Little Rock, AR.

**Ultrasound Assisted Reactions with Sodium Percarbonate. Y. Cao, A. Toland and D. T. C. Yang, University of Arkansas at Little Rock, AR.

Synthesis and Characterization of Trispyrazolylborate Complexes of Nickel (III). P. J. Desrochers, J. C. Sharp, University of Central Arkansas, Conway, AR.

Friday, April 8, 1994

LS 204

BOTANY

Chair: Dr. E. Leon Richards, Arkansas State University.

Noteworthy Collections: Arkansas. Phillip E. Hyatt, Savannah River Forest Station, New Ellenton, SC.

Notes on Bryophytes and Pteridophytes of Southern Arkansas. James R. Bray, Greg A. Whitehead, Daniel L. Marsh, Dennis W. McMasters and Winfred D. Crank, Henderson State University, Arkadelphia, AR.

The Shumard Oak Complex in Arkansas. George P. Johnson, Arkansas Tech University, Russellville, AR.

A Comparison of Soil pH and Vegetation for Maple-Leaved Oak Habitat. David W. Rouw and George P. Johnson, Arkansas Tech University, Russellville, AR.

Comparative Gas-Exchange in Leaves of Intact and Clipped, Natural and Planted Cherrybark Oak (*Quercus Pagoda* Raf.) Seedlings. Brian R. Lockhart, University of Arkansas at Monticello, AR, and John D. Hodges, Mississippi State University, Mississippi State, MS.

Detection of *Septoria nodorum* on Wheat Leaves with an Antibody-based Serological Kit. Rebecca Dukes, University of Arkansas at Little Rock, AR, and Gary L. Cloud, University of Arkansas, Cooperative Extension Service, Little Rock, AR.

Distance of interference of Red Rice (*Oryza sativa*) in Rice (*O. sativa*). Roy J. Smith Jr., Sam L. Kwon, Agricultural Research Service, U.S.D.A., Stuttgart, AR, and Ronald E. Talbert, University of Arkansas at Fayetteville, AR.

Break

Chair: Dr. Dennis W. McMasters, Henderson State University.

*Variability in Nectar Characteristics of *Impatiens capensis*. Marti Terrell and Janet Lanza, University of Arkansas at Little Rock, AR.

*Nectar Production in *Lobelia puberula*: Undergraduate Research on Native Plants and their Pollinators. Michael J. Boyd, Lachi R. Kishen and William H. Baltosser, University of Arkansas at Little Rock, AR.

A New Candidate Species, *Chaetomium elatum*, for Wood Rot Via Lignin Biodegradation. Wilson H. Howe, University of Arkansas at Little Rock, AR, and Joyce M. Hardin, Hendrix College, Conway, AR.

Biosystematic Studies of Arkansas Lycopods. James R. Bray, Greg A. Whitehead, Dennis W. McMasters and Daniel L. Marsh, Henderson State University, Arkadelphia, AR.

Evidence for Genetic Homogeneity among Populations of *Lycoperdon pyriforme* Based on Patterns of Isozymic Variation. Martin I. Huss, Arkansas State University, State University, AR.

An investigation of the Failure of Traditional Economic Incentives in Regenerating Arkansas' Non-Industrial Private Forest: A Historical Perspective. James R. Jolley, University of Arkansas at Monticello, AR.

Friday, April 8, 1994

LS 205

BIOMEDICAL

Chair: Dr. Lawrence W. Hinck, Arkansas State University.

*The Distribution and Morphology of Nitric Oxide Producing Neurons in the Rat Brain Septum. Jeff Marotte, Hendrix College, Conway, AR, and Kevin Phelan, University of Arkansas for Medical Sciences, Little Rock, AR.

*Development of Anti-Peptide Antibodies Targeted Against Specific Regions of the Rat Cannabinoid Receptor. Christopher E. Collins, Hendrix College, Conway, AR, Elizabeth M. Laurenzana, University of Arkansas for Medical Sciences, Little Rock, AR Billy R. Martin, Medical College of Virginia, Richmond, VA, and S. Michael Owens, University of Arkansas for Medical Sciences, Little Rock, AR.

*Decreased Sensitivity of Human Multiple Transitional Cell Carcinoma Cells (252J) to 5-Fluorouracil by Anguidine. Jacqueline A. Potter, Sederick C. Rice, Chandreas S. Mosley, Mattie M. Glover, and Clifton Orr, University of Arkansas at Pine Bluff, AR.

*Effects of Ethanol on Cultured Microglial Cells. Annisha C. Hickman, University of Arkansas at Pine Bluff, AR, G. C. Mays and D. L. Davies, University of Arkansas for Medical Sciences, Little Rock, AR.

*Regulation of the Extracellular Signal Regulated Kinase 2 (ERK2) by Phorbol Esters and Fetal Calf Serum in Human Melanoma Cells. Miram Glass, University of Arkansas at Pine Bluff, AR, Fan Yang and Estela E. Medrano, University of Cincinnati, Cincinnati, OH.

*Transforming Growth Factor-Beta (TGF β) Controls Astrocyte Expression of Growth Factors and Extracellular Matrix. Laura Bogan, Hendrix College, Conway, AR, and Cynthia Kane, University of Arkansas for Medical Sciences, Little Rock, AR.

**The Complexity of Fetal Movement Detection Using a Single Doppler Ultrasound Transducer. William A. Russell, Jr., University of Arkansas at Little Rock, AR, Curtis L. Lowery, MD, Patrick J. Baggot, MD, University of Arkansas for Medical Sciences, Little Rock, AR, James D. Wilson, University of Arkansas at Little Rock, AR, Robert Walls, Ph.D., University of Arkansas for Medical Sciences, Little Rock, AR, Roger M. Hawk, Ph.D., University of Arkansas at Little Rock, AR, and Lynn Bentz, RN, University of Arkansas for Medical Sciences, Little Rock, AR.

Break

Chair: Dr. William M. Willingham, University of Arkansas at Pine Bluff.

Lipids Changes in Nude Mice Implanted Subcutaneously with Cells of Human Prostate Adenocarcinoma Grade IV. Lawrence M. Mwasi, University of Arkansas at Pine Bluff, AR.

UV-Induced Chromosomal Breaks and the DNA Replication Fork. Daniel M. Yoder, Jason M. Hiles and Gaston Griggs, John Brown University, Siloam Springs, AR.

Computational Fluid Dynamics in Small Airway Models of the Human Lung. Galen Burnside, University of Arkansas at Little Rock, AR, Dr. Jeff Hammersley, University of Arkansas for Medical Sciences at Little Rock,

AR, Dr. Rama Reddy, University of Arkansas at Little Rock, AR, and Dr. Boyd Gatlin, Mississippi State University, Mississippi State, MS.

*Physicochemical and Biological Parameters of Ephedrine Prodrugs. Lance M. Williams, Lawrence D. Fitz and Richard B. Walder, University of Arkansas at Pine Bluff, AR.

*Partition Coefficients of Essential Metalloelement Complexes. Israt J. Chowdhury, Tim Henderson, Lawanda Jones, Shawndra Thompson, Richard B. Walker and William M. Willingham, University of Arkansas at Pine Bluff, AR.

Friday, April 8, 1994

LS 206

HERPETOLOGY

Chair: Betty G. Cochran, USDA Forest Service, Ouachita National Forest.

Pleistocene Amphibians of the Jones Local Fauna, Meade County, Kansas. Leo Carson Davis, Southern Arkansas University, Magnolia, AR.

Riparian Association of Montane Cottonmouths in SW Arkansas. Seth White, C. Metcalf, K. Casico, Northeast Louisiana University, Monroe, LA, B. Cochran, USDA Forest Service, Ouachita National Forest, Glenwood, AR, and F. Pezold, Northeast Louisiana University, Monroe, LA.

Female Reproductive Traits in Selected Arkansas Snakes. Stanley E. Trauth, Arkansas State University, State University, AR, Robert L. Cox, (deceased), Walter E. Meshaka, Archbold Biological Station, Lake Placid, FL, Brian P. Butterfield, Auburn University, Auburn AL, and Anthony Holt, Arkansas State University, State University, AR.

Reproductive Cycles in Two Arkansas Skinks in the Genus *Eumeces* (Sauria: Scincidae). Stanley E. Trauth, Arkansas State University, State University, AR.

Ultrastructure of *Myxidium serotinum* (Protozoa: Myxozoa) from the Gallbladder of *Bufo speciosus* (Amphibia: Anura). Chris T. McAllister, Dept. Veterans Affairs Medical Center, Dallas, TX, B. L. J. Delvinquier, University of the Witwatersrand, Johannesburg, South Africa, and Stanley E. Trauth, Arkansas State University, State University, AR.

Parasites of the Graybelly Salamander, *Eurycea multiplicata griseogaster* (Caudata: Plethodontidae), from Arkansas. Chris T. McAllister, Dept. Veterans Affairs Medical Center, Dallas, TX, Stanley E. Trauth, Arkansas State University, State University, AR, Charles R. Bursey, Pennsylvania State University-Shenango Campus, Sharon, PA, Steve J. Upton, Kansas State University, Manhattan, KS.

Friday, April 8, 1994

LS 206

INVERTEBRATE ZOOLOGY

Chair: Dr. Robert L. Watson, University of Arkansas at Little Rock.

Burying Beetle (Coleoptera: Silphidae, *Nicrophorus*) Surveys on Poteau Ranger District, Ouachita NF. Joseph C. Neal and M. Earl Stewart, Poteau Ranger District, USDA Forest Service, Waldron, AR.

A Larval Mosquito Survey in Northeastern Arkansas including a New Record for *Aedes albopictus*. David H. Jamieson, Arkansas State University-Beebe, Beebe, AR, Larry A. Olson and J. D. Wilhide, Arkansas State University, State University, AR.

*Reproductive Structures of Adult Cottonwood Borer Beetles (*Plectrodera sculator*). Jason A. Kilgore, Hendrix College, Conway, AR, and Steven K. Goldsmith, Tulsa University, Tulsa, OK.

Genetic Variability in Developing Periodical Cicadas. Eric Stout, Lance T. Adams, Lisa R. Duke, James J. English, and Alvan A. Karlin, University of Arkansas at Little Rock, AR.

Occurrence of Massospora from Non-Emergent Periodical Cicada. Lisa R. Duke, Daniel White, James J. English, Lance T. Adams, Eric Stout, Alvan A. Karlin and Maurice G. Kleve, University of Arkansas at Little Rock, AR.

Friday, April 8, 1994

LS 207

PHYSICS/COMPUTERS/ENERGY/GEOLOGY

Chair: Dr. William J. Braithwaite, University of Arkansas at Little Rock.

Calculation of Energy Levels in a Linear Potential Well. H. E. McCloud, Arkansas State University, State University, AR.

**Using the Cern Program-Library Graphics and Interactive Data Display. Morgan T. Burks, Christine A. Byrd and W. J. Braithwaite, University of Arkansas at Little Rock, AR.

**An Integrated Data Acquisition and Data Analysis System for High Energy Physics. Charles A. Byrd, Christine A. Byrd and W. J. Braithwaite, University of Arkansas at Little Rock, AR.

**Application of Machine Learning Principles to Modeling of Nonlinear Dynamic Systems. Murry R. Clark, University of Arkansas at Little Rock, AR.

Structural Design by Evolution. S. Malasri, D. A. Halijan and M. L. Keough, Christian Brothers University, Memphis, TN.

Construction of a Reliable, Inexpensive Cryofixation Device. L. A. Mink and R. A. Buchanan, Arkansas State University, State University, AR.

**Solid State NMR of Hydrogen in Thin Film Synthetic Diamond. Galen Burnside and Roger M. Hawk, University of Arkansas at Little Rock, AR.

Break

Chair: Dr. Robert D. Engelken, Arkansas State University.

**Polishing and Planarizing of CVD-Diamond for MCM Application. S. Raju, A. P. Malshe, W. D. Brown and H. A. Naseem, University of Arkansas at Fayetteville, AR.

A Trace Element Soil Analysis of the Sloan Site: A 10,500 Year Old Cemetery in Northeast Arkansas. D. Glen Akridge and David Chittenden III, Arkansas State University, State University, AR.

Pleistocene and Holocene Remains from the Red River, Southwest Arkansas. Terry A. Sanders, Taylor High School, Taylor, AR.

Development of a Model Undergraduate Laboratory Course Sequence in Semiconductor Materials through the NSF ILI and NASA JOVE Programs. Dr. Robert K. Engelken, Arkansas State University, State University, AR.

Analogy of Stability in the Lasers with Saturable Absorbers and Human Mind. Mansour Mortazavi and S. P. Singh, University of Arkansas at Pine Bluff, AR.

*Tetraethylene Glycol-Based Electrolytes for High Temperature Electrochemical Deposition of Compound Semiconductors. Chris Poole, Dr. Robert D. Engelken, Brandon Kemp and Jason Brannen, Arkansas State University, State University, AR.

*Storm Dominated Channel Sequences on a Shallow Marine Shelf: Middle Morrowan of Northwestern Arkansas. Kimberly R. Jones, University of Arkansas at Fayetteville, AR.

Friday, April 8, 1994

LS 444

AQUATIC BIOLOGY

Chair: Roland McDaniel, FTN & Associates
Water Resource Consultants.

Peltodytes (Halipidae: Coleoptera) in Arkansas. George L. Harp, Arkansas State University, State University, AR.

First Record of *Leptodora kindti* (Crustacea: Cladocera) in Dardanelle Reservoir and Review of Other Recent Additions to the Faunal Community. John D. Rickett and Robert L. Watson, University of Arkansas at Little Rock, AR.

A 24-Year Study of the Benthic Community in Dardanelle Reservoir. John D. Rickett and Robert L. Watson, University of Arkansas at Little Rock, AR.

Benthic Macronvertebrate Densities in an Oligotrophic Headwater Creek. Flaherty R. Wheeler, Northeast Louisiana University, Monroe, LA, B. Cochran, USDA Forest Service, Ouachita National Forest, Glenwood, AR, F. Pezold, Northeast Louisiana University, Monroe, LA.

A Recent Record of the Plains Minnow, *Hybognathus placitus* Girard, from Arkansas. Thomas M. Buchanan, Westark Community College, Fort Smith, AR, and Henry W. Robison, Southern Arkansas University, Magnolia, AR.

First Record of the Channel Shiner, *Notropis wickliffi* Trautman, in Arkansas and comments on the Current River Population of *Notropis volucellus* (Cope). Henry W. Robison, Southern Arkansas University, Magnolia, AR.

Break

Chair: Alan Price, Arkansas Dept. of Pollution Control & Ecology.

**Age and Growth of the Largemouth Bass, *Micropterus salmoides*, of Lake Ashbaugh. Rosalynne M. Davis and Ronald L. Johnson, Arkansas State University, State University, AR.

A Noninvasive Method of Estimating Populations of Yellow Grub (*Clinostomum marginatum*) in Stream Black Bass and Farm-Raised Channel Catfish. James I. Daly, University of Arkansas for Medical Sciences, Little Rock, AR, and Jeurel Singleton, University of Arkansas at Fayetteville, AR.

Food Habits of Introduced Rainbow Trout (*Oncorhynchus mykiss*) in the Upper Little Missouri River Drainage of Arkansas. Chris Metcalf, Northeast Louisiana University, Monroe, LA, b. Cochran, USDA Forest Service, Ouachita National Forest, Glenwood, AR, and F. Pezold, Northeast Louisiana University, Monroe, LA.

Spawning Habitat of the Paleback Darter in the Ouachita Mountains, AR. Mitzi G. Pardew, USDA Forest Service, Womble Ranger District, Mt. Ida, AR, and Dean Heckathorn, U.S. Fish and Wildlife Service, Portland, OR.

Pre-spawning Migration of Channel Catfish into Three Warmwater Tributaries—effects of a Cold Tailwater. Gary L. Siegarth, Iowa Dept. Natural Resources, Manchester, IA, and James E. Johnson, Arkansas Cooperative Fish and Wildlife Research Unit, University of Arkansas at Fayetteville, AR.

**Selected Community Characteristics of Freshwater Mussels (Unionacea) in the Cache River, Arkansas. Alan D. Christian, John L. Harris, William R. Posey and George L. Harp, Arkansas State University, State University, AR.

*Status of The Zebra Mussel (*Dreissena polymorpha*) in the Arkansas River System. Jeffrey I. Herod and Joseph N. Stoeckel, Arkansas Tech University, Russellville, AR.

Saturday, April 9, 1994

LS 203

CHEMISTRY

Chair: Dr. J. Edward Bennett, Arkansas State University.

Preparation and Assay of New Pepstatin Analogs. Rose McConnell. University of Arkansas at Monticello, AR.

Thermal Decomposition Studies of Selected Transition Metal Polysulfide Complexes. II. Effect of Atmosphere on Decomposition. Benjamin Rougeau and M. Draganjac, Arkansas State University, State University, AR.

Differential Thermal and Gravimetric Analysis of the Cr-O-H₂O System. J. Edward Bennett, M. Draganjac and Eric Barnett, Arkansas State University, State University, AR.

New Organometallic Oligomer. Reaction of Titanocene Dichloride with Acetylenedicarboxylate. Tanya L. Hagler, M. Draganjac, Paul Nave, J. Edward Bennett, Farooq Khan, Robert Engelken, Gerard Williams, Chris Poole, Kwok Fai Yu, Arkansas State University, State University, AR.

Chemical Kinetics of Phospholipid Hydrolysis Catalyzed by the Venom of the Brown Recluse Spider (*Loxosceles reclusa*) as Followed by P-31 NMR. Michael Merchant, James Hinton and Collis Geren, University of Arkansas at Fayetteville, AR.

*Cross-Linkable Conduction Polymers. Tito Viswanathan and Sterling Rook, University of Arkansas at Little Rock, AR.

Break

Chair: Dr. J. Edward Bennett, Arkansas State University.

Coherent Mixing of Scattered Laser Light, Aslam H. Chowdhury, University of Arkansas at Pine Bluff, AR.

*Determining the Growth Rate of Bacteria in Antibiotic Using Laser. Stephanie Johnson, William Willingham, Shelton Fitzpatrick and Aslam H. Chowdhury, University of Arkansas at Pine Bluff, AR.

Saturday, April 9, 1994

LS 204

GEOLOGY/ASTRONOMY/PHYSICS

Chair: Dr. Andrew T. Sustich, Arkansas State University

Tree-Ring Evidence of New Madrid Seismic Activity 1321-1991. M. K. Cleveland, D. W. Stahle, University of Arkansas at Fayetteville, AR, and R. B. VanArsdale, Memphis State University, Memphis, TN.

**Monte Carlo Simulations of a NASA Scintillating Optical Fiber Calorimeter for 10- to 1,000-MEV Gamma Rays. R. Gillum, A. Yang and D. Wold, University of Arkansas at Little Rock, AR.

**Monte Carlo Simulations of a NASA Scintillating Optical Fiber Calorimeter-for 0.5- to 1.5-TEV Gamma Rays. Z. Yang, R. Gillum and d. Wold, University of Arkansas at Little Rock, AR.

*Gamma Ray Emissions From Binary Pulsar Systems. Tony A. Hall and Andrew T. Sustich, Arkansas State University, State University, AR.

A Method for Determining Atmospheric Aerosol Optical Depth Using Solar Transmission Measurements. Felix Tendeku, University of Arkansas at Pine Bluff, AR.

**Evaluation of Photodiode Arrays in Rocket Plume Monitoring and Diagnostics. D. H. Snider, M. K. Hudson, R. B. Shanks and R. Cole, University of Arkansas at Little Rock, AR.

Break

Chair: Dr. William J. Braithwaite, University of Arkansas at Little Rock.

*Energetic Photon Scattering From Electrons: In Advanced Laboratory. Christine A. Byrd, Morgan T. Burks, and W. J. Braithwaite, University of Arkansas at Little Rock, AR.

Summary of M-Shell Ionization by Light Incident Ions. Rahul Mehta, University of Central Arkansas, Conway, AR.

**Multisite Microprobes for Electrochemical Recordings in Biological Dynamics. G. Screenivas, S. S. Ang, R. M. Ranade, A. S. Salian and W. D. Brown, University of Arkansas in Fayetteville, AR.

**A comparison of High-Temperature Superconductors in Multi-Chip Module Applications. D. E. Ford, S. S. Scott, S. S. Ang, and W. D. Brown, University of Arkansas at Fayetteville, AR.

**Geologic Site Evaluation for Assessing Non-Point Source Pollution in the St. Francis Sunken Lands, Northeast Arkansas. Jonathan Q. Miller and M. J. Guiccione, University of Arkansas at Fayetteville, AR.

Saturday, April 9, 1994

LS 205

MICROBIOLOGY/CELLULAR BIOLOGY

Chair: Dr. Ronald L. Johnson, Arkansas State University.

Dietary Levels of Starch Affects Intestinal Flow of Total and Bacterial Calcium, Copper, and Manganese in Ruminants. D. W. Kennedy, Arkansas State University, State University, AR, and L. D. Bunting, Louisiana State University, Baton Rouge, LA.

The isolation of *Borrelia burgdorferi* from infected Laboratory Mice. Lawrence W. Hinck, Arkansas State University, State University, AR.

*Determination of Tumor Necrosis Factor Levels in Genital Tracts of Guinea Pigs Infected with Chlamydia. L. R. Kishen, University of Arkansas at Little Rock, AR, T. Darville, K. Simpson, Children's Hospital, Little Rock, AR, and R. G. Rank, University of Arkansas for Medical Sciences, Little Rock, AR.

*Utilization of Object-Oriented Database Design for the Complete Analysis of Data from the Human Genome Project. Chris Bennett and Alvan A. Karlin, University of Arkansas at Little Rock, AR.

DNA Sequence and Genetic Organization of the Inverted Repeat Region of the Simian Varicella Virus Genome. Nanette J. Gusick and Wayne L. Gray, University of Arkansas for Medical Sciences, Little Rock, AR.

Chain Termination Sequencing of DNA Using Silver Staining Technique. Ronald L. Johnson, Arkansas State University, State University, AR.

Break

Arkansas Academy of Science

Chair: Dr. David F. Gilmore, Arkansas State University.

Chair: Dr. C. Renn Tumilson, Henderson State University.

Analysis of Anti-Chlamydial Mechanism of T Cells in the Polarized Epithelial-Lymphocyte Culture System. I. U. Igietseme, University of Arkansas for Medical Sciences, Little Rock, AR, P. B. Wyrick, D. Goyeau, University of North Carolina School of Medicine, Chapel Hill, NC, and R. G. Rank, University of Arkansas for Medical Sciences, Little Rock, AR.

Enzymatic Degradation of Biodegradable Plastic by Myxobacteria. David E. Gilmore, Arkansas State University, State University, State University, AR, and R. Clinton Guller, University of Massachusetts, Amherst, MA.

Saturday, April 9, 1994

LS 207

SCIENCE EDUCATION/TOXICOLOGY/WATER QUALITY

Chair: Dr. James J. Daly, University of Arkansas for Medical Sciences.

*Survey of Southwest Arkansas Students' Attitudes Toward Science. Anna Smith, Connie Baber and Renn Tumilson, Henderson State University, Arkadelphia, AR.

**Water Quality of an Ozark Stream Receiving Urban Point and Non-Point Pollution: Total Coliform and Total Bacterial Counts. Claude Rector, W. David Holcomb and James J. Daly, University of Arkansas for Medical Sciences, Little Rock, AR.

**Water Quality of an Ozark Stream Receiving Urban Point and Non-Point Pollution: Physics-Chemical Parameters. Phillip B. Drope and James J. Daly, University of Arkansas for Medical Sciences, Little Rock, AR.

**Effect of Pesticides for Mosquito Control on Target and Non-Target Organisms. Cristin D. Milam, Jerry L. Farris, J. D. Wilhide and Larry A. Olson, Arkansas State University, State University, AR.

Saturday, April 9, 1994

LS 344

ECOLOGY/CONSERVATION

Chair: Dr. Michael J. Harvey, Tennessee Technological University.

*A Comparison of Macrophytes of Two Small Northwest Arkansas Reservoir. John J. Sullivan and A. V. Brown, University of Arkansas at Fayetteville, AR.

Status of Endangered Gray Bat (*Myotis grisescens*) Hibernating Populations in Arkansas. Michael J. Harvey, Tennessee Technological University, Cookeville, TN.

Herpetofaunal Responses to Even-Aged and Selective Timber Harvesting in the Ouachita Mountains, Arkansas. Doyle L. Crosswhite, Stanley Fox and Ronald E. Thill. Oklahoma State University, Stillwater, OK.

Renewal and Recovery: The Red-Cockaded Woodpecker and Shortleaf Pine/Bluestem Grass Ecosystem on the Ouachita National Forest. George A. Bukenhofer, Joseph C. Neal and Warren G. Montague, Poteau Ranger District, USDA Forest Service, Waldron, AR.

*Does Simulated Herbivory of *Passiflora incaarnata* Cause an Increase in Ant Attendance? James Bryant and Janet Lanza, University of Arkansas at Little Rock, AR.

*Species Packing in a North Carolina Creek. James I. English, Alvan A. Karlan, University of Arkansas at Little Rock, AR, and Laurie D. Lacer, Biotechnical Services, Inc., North Little Rock, AR.

Break

*A Preliminary Assessment of the Effect of Supplemental Feeding on Movement of Three-Toed Box Turtles (*Terrapene carolina triunguis*). Jeffrey E. Demuth and Michael V. Plummer, Harding University, Searcy, AR.

*The Effects of Timber Management on Small Mammal Populations in Southwestern Arkansas. David Eller and Renn Tumilson, Henderson State University, Arkadelphia, AR.

*Plant and Animal Recovery after Coal Mine Reclamation. John Pringle and Randy Groves. University of the Ozarks, Clarksville, AR.

Cavity Protection Techniques for Red-Cockaded Woodpeckers. Warren Montague, Poteau Ranger District, USDA Forest Service, Waldron, AR.

The Effects of Forest Management on the Densities and Population Biology of Neotropical Migrant Birds in West-Central Idaho: A Preliminary Study. James C. Bednarz, Arkansas State University, State University, AR.

Sex Ratio and Success, An Assessment of *Lindera melissifolia* in Arkansas. Robert D. Wright, Conway, AR.

A Classification System for the Natural Vegetation of Arkansas. Thomas Foti, Arkansas Natural Heritage Commission, Little Rock, AR, Ziaojun Li, University of Arkansas at Fayetteville, AR, Martin Blaney, Arkansas Game and Fish Commission, Little Rock, AR, and Kimberly G. Smith, University of Arkansas at Fayetteville, AR.

Saturday, April 9, 1994

LS 444

BIRDS/MAMMALS

Chair: Dr. Todd Wiebers, Henderson State University.

Species of Birds New to the State Recorded in Arkansas Since the Mid 1980s. Douglas A. James, Max Parker, Charles Mills, Joseph C. Neal, University of Arkansas at Fayetteville, AR.

Long Range Dispersal of a Red-Cockaded Woodpecker. Warren Montague and George Bukenhofer, Poteau Ranger District, USDA Forest Service, Waldron, AR.

Food Habits of Barn Owls From a Nest Site in Southwestern Arkansas. Jonathan Westmoreland and Renn Tumilson, Henderson State University, Arkadelphia, AR.

Weight Estimates for Arkansas White Tailed Deer From Field Measurements. J. D. Wilhide, Jeffrey W. Ienness, Arkansas State University, State University, AR, and Michael E. Cartwright, Arkansas Game and Fish Commission, Calico Rock, AR.

Notes on the Natural History of *Lasiurus borealis* (Chiropter: Vespertilionidae) in Arkansas. David A. Saugey, USDA Forest Service, Jessieville, AR, Betty G. Cochran, USDA Forest Service, Glenwood, AR, and Gary A. Heidt, University of Arkansas at Little Rock, AR.

Use of Visual and Tactile Behaviors by Rate (*Rattus norvegicus*) in an Object Discrimination Swimming Task. Todd Wiebers, Henderson State University, Arkadelphia, AR.

Break

Chair: David A. Saugey, USDA Forest Service, Jessieville, AR.

New Records for the Badger (*Taxidea taxus*) in Arkansas. Michael Cartwright, Arkansas Game and Fish Commission, Calico Rock, AR, and Gary Heidt, University of Arkansas at Little Rock, AR.

Program

Nonendangered Mammals of Questionable Status in Arkansas. Gary A. Heidt, University of Arkansas at Little Rock, AR, and V. Rick McDaniel, Arkansas State University, State University, AR.

*Food Habits of the Common Barn Owl in Western Arkansas. Rhonda M. Huston and Thomas A. Nelson, Arkansas Tech University, Russellville, AR.

*Heavy Metal Concentrations in the Kidneys of White-Tailed Deer on Fort Chaffee, Arkansas. Greg Humphreys, Thomas Nelson and Timothy Sherwood, Arkansas Tech University, Russellville, AR.

*Faunal Use of Nest Boxes in the Ouachita Mountains of Central Arkansas. Paul T. Caster, Gary A. Heidt and Karen D. Stone, University of Arkansas at Little Rock, AR.

*Comparison of Structure of White Winter Fur and Brown Summer Fur of Northern Mammals. John E. Russell and Renn Tumison, Henderson State University, Arkadelphia, AR.