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## 76th Annual Meeting, Program

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# PROGRAM

## Arkansas Academy of Science

Seventy-Sixth Annual Meeting

3-4 April, 1992

University of Central Arkansas at Conway

**Friday, 3 April, 1992**

Registration  
Executive Committee  
First Business Meeting  
Exhibits and Refreshments

### Paper Sessions

Biomedical  
Invertebrate Zoology  
Botany  
Chemistry: Analytical, Inorganic and Physical  
Physics, Math, Engineering, Geology

Banquet

Speaker: Dr. Lincoln Brower

*The Grand Saga of the Monarch Butterfly*

**Saturday, 4 April, 1992**

Registration  
Exhibits and Refreshments  
Second Business Meeting

### Paper Sessions

Chemistry: Organic, Biochemistry  
Physics, Geology  
Science Education  
Aquatic and Environmental Biology  
Vertebrate Zoology  
Microbiology and Molecular Biology

## SECTION PROGRAMS

[\* = Student Paper]

Friday, April 2, 1991

### BIOMEDICAL

Chairman: Mark V. Sutherland, Hendrix College

THE EFFECTS OF BACTERIAL LIPOPOLYSACCHARIDE ON PLASMA CORTICOSTERONE CONCENTRATIONS AND BODY TEMPERATURES OF NEW ZEALAND RABBITS (*ORYCTOLAGUS CUNICULUS*).

Wilkins, P.K., S.N. David and L.W. Hinck, Department of Biological Sciences, Arkansas State University, P.O. Box 599, State University, AR 72467-0599.

THE EFFECT OF BACTERIAL LIPOPOLYSACCHARIDE-INDUCED FEVER ON THE HUMORAL RESPONSE OF NEW ZEALAND WHITE RABBITS.

Lawrence W. Hinck and Stanley N. David, Department of Biological Sciences, Arkansas State University, State University, AR 72467-0599.

IN-VIVO SPECTROSCOPIC AND IMAGING STUDIES OF PHOTOSENSITIZERS IN PHOTODYNAMIC THERAPY.

Y. Liu, R.M. Hawk, A.H. Fowler, R.K. Randey, S. Ramaprasad, Department of Electronics and Instrumentation, University of Arkansas, Little Rock, AR 72205.

ENHANCEMENT OF ANTIGEN-SPECIFIC ANTIBODY SECRETION BY INTERFERON.

Tony E. Caver, J. Mitchell Winkler, Karen E. Eckles (Mark V. Sutherland), Department of Biology, Hendrix College, Conway, AR 72032.

\*INTERFERON-STIMULATED ANTIBODY SECRETION FROM CHEMICALLY SUPPRESSED RABBIT SPLEEN CELLS.

J. Mitchell Winkler, Tony Caver, Karen Eckles, Mark Sutherland, Biology Department, Hendrix College, AR 72032.

\*THE EFFECT OF *GRIFFONIA SIMPLIFICOLIA*-I-B4 ON THE PRODUCTION OF TNF- $\alpha$  BY HUMAN MONOCYTES.

David H. Holley, (Mark Sutherland), Biology Department, Hendrix College, Conway, AR 72032.

\*METHODS FOR DETECTING ANTIMICROBIAL ACTIVITY IN LYMPHOID CELL CULTURES.

Karen E. Eckles, Tony E. Caver, J. Mitch Winkler, (Mark Sutherland), Department of Biology, Hendrix College, Conway, AR 72032.

\*HYPOTHYROIDISM AND METABOLISM OF OMEGA SIX POLYUNSATURATED ESSENTIAL FATTY ACIDS.

Sylvia Hill and Lawrence M. Mwasi, Department of Biology, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

\*OXAZOLIDINES AS POTENTIAL PRODRUGS.

Bridgette Sammuels and Richard B. Walker, Chemistry Department, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

\*EXTRACTION AND PARTIAL PURIFICATION OF AN ANTI-SECRETORY COMPOUND FROM A NATURAL SOURCE USING HIGH PERFORMANCE LIQUID CHROMATOGRAPHY.

Robert E. Adair and Jeffery R. Demarest, University of Arkansas-Fayetteville, Biological Sciences, SE 632, Fayetteville, AR 72701.

HEPG2 CELLS SERVE AS AN *IN VITRO* MODEL FOR CYP2E1-DEPENDENT METABOLISM OF ACETAMINOPHEN.

A.L. Roe, J.E. Snawder, R.W. Benson, D.A. Casciano and D.W. Roberts, National Center for Toxicological Research, Jefferson, AR 72079.

\*ALTERATION BY ANGUININE OF THE ANTIPROLIFERATIVE EFFECTS OF CISPLATIN, 5-FLUORO-URACIL, AND VINCRISTINE IN HUMAN MULTIPLE TRANSITIONAL CELL CANCER CELLS (253J) *IN VITRO*.

Angela W. Davis, Clifton Orr, and Mattie G. Glover, Department of Biology, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

\*FLUORESCIN ANGIOGRAPHY: AN EFFECTIVE MEANS OF ASSESSING RETINAL VASCULAR PATHOLOGY IN NEWBORN RATS.

Brad D. Johnson and John S. Penn, Arkansas Center for Eye Research, University of Arkansas for Medical Sciences, Little Rock, AR 72205.

THE EFFECT OF PHENCYCLIDINE (PCP) METABOLITE COVALENT BINDING ON PCP STEADY-STATE CLEARANCES IN SPRAGUE-DAWLEY RATS.

S. Michael Owens and Mark A. Zorbas, Department of Pharmacology and Toxicology, University of Arkansas for Medical Sciences, Little Rock, AR 72205.

### INVERTEBRATE ZOOLOGY

Chairman: Joseph R. Lombardi, Hendrix College

A SYNOPSIS OF THE GENUS *TROPISTERNUS* IN ARKANSAS.

George L. Harp and Walter H. Neasbitt, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

NEW RECORDS OF ARKANSAS ODONATA.

Phoebe A. Harp and George L. Harp, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

A CHECK-LIST OF THE LYCOSIDAE AND GNAPHOSIDAE OF ARKANSAS.

Sharon Burris and Peggy Rae Dorris, Henderson State University, Box 7544, Arkadelphia, AR 71999-0001.

THE OCCURRENCE OF POISONOUS SPIDERS IN ARKANSAS.

Peggy Rae Dorris, Henderson State University, Box 7544, Arkadelphia, AR 71999-0001.

MASS ENTRAPMENT OF APHIDS IN LETTUCE LATEX.

David E. Dussourd, Department of Biology, University of Central Arkansas, Conway, AR 72035.

ECOLOGY AND SUCCESSION OF CARRION INSECTS.

Kelly K. Agnew, (Joseph R. Lombardi), Biology Department, Hendrix College, 1601 Harkrider, Conway, AR 72032.

HEMATOZOA OF COMMON GRACKLES, *QUISCALUS QUISCULA* (LINNAEUS).

Arthur A. Johnson, Hendrix College, Conway, AR 72032.

### BOTANY

Chairman: John S. Choinski, Kenneth J. Freiley, University of Central Arkansas

\*NECTAR PRODUCTION AND THE POLLINATION BIOLOGY OF TWO SPECIES OF FLOWERING VINES.

Michael D. Warriner, Jill M. Gregory, and William H. Baltosser, Department of Biology, University of Arkansas at Little Rock, Little Rock, AR 72204.

\*NECTAR PRODUCTION AND THE POLLINATION BIOLOGY OF TWO SPECIES OF *LOBELIA*.

Jill M. Gregory, Michael D. Warriner, and William H. Baltosser, Department of Biology, University of Arkansas at Little Rock, Little Rock, AR 72204.

## Program

**\*G+C RATIOS IN TALL FESCUE DNA AS MEASURED BY MELTING POINT CURVES.**

Robbin G. Lone, Alvan A. Karlin, Department of Biology, University of Arkansas, Little Rock, AR 72204, and R. Marty Roop, Department of Microbiology, University of Arkansas for Medical Sciences, Little Rock, AR 72205.

**GREEN TREEFROGS AND GRASSHOPPERS AS VECTORS FOR DISPERSAL OF *COLLETOTRICHUM GLOEOSPORIOIDES*.**

G. Moore, X.B. Yang, and D.O. TeBeest, Department of Plant Pathology, 217 Plant Science Building, University of Arkansas, Fayetteville, AR 72701.

**GENETIC UNIFORMITY WITHIN ARKANSAS POPULATIONS OF THE THREATENED SHRUB *NEVIUSIA ALABAMENSIS* (ROSACEAE), ALABAMA SNOW WREATH.**

Kenneth J. Freiley, Biology Department, University of Central Arkansas, Conway, AR, 72035.

**OPTIMUM CONE COLLECTION PERIOD IN ARKANSAS FOR ESTABLISHING POLYEMBRYOGENESIS IN LOBLOLLY PINE.**

J.M. Al-Khayri, F.H. Huang, and H.T. Zhang, Department of Horticulture and Forestry, University of Arkansas, Fayetteville, AR 72701.

**AN ASSESSMENT OF TIMBER RESOURCE VALUES IN ARKANSAS.**

Williams, R.A. and R.A. Kluender, University of Arkansas at Monticello, Department of Forest Resources, P.O. Box 3468, Monticello, Arkansas, 71655.

**EFFECT OF WATER STRESS ON SEEDLING GROWTH OF THE LOWLAND AFRICAN SAVANNA TREE, *COLOPHOSPERMUM MOPANE*.**

John S. Choinski, Jr., Department of Biology, University of Central Arkansas, Conway, AR 72035.

**WATER USE EFFICIENCY COMPARED WITH DROUGHT TOLERANCE IN RICE.**

Md. Jalaluddin and M. Price, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601, and R.H. Dilday, USDA/ARS, Stuttgart, AR 72701.

**MEASURING SHRUBLAND VEGETATIONAL STRUCTURE USING AVIAN HABITATS AS AN EXAMPLE.**

Douglas A. James, Department of Biological Sciences, University of Arkansas, Fayetteville, AR 72701.

**CHEMISTRY: ANALYTICAL, INORGANIC, AND PHYSICAL**

Chairman: Jerry M. Manion, University of Central Arkansas

**\*THE USE OF A SPUTTERING ION SOURCE IN THE STUDY OF GAS PHASE TRANSITION METAL ION CHEMISTRY.**

William R. Everett, William S. Taylor, Department of Chemistry, University of Central Arkansas, Conway, AR 72035.

**\*ANALYSIS AND REMOVAL OF HEXACHLOROBENZENE IN ENVIRONMENTAL SAMPLES. MARK WILSON,**

Ali U. Shaikh, Department of Chemistry, University of Arkansas at Little Rock, Little Rock, AR 72204, and Margaret Robinson, GEM, Inc., Malvern, AR 72104.

**\*LIQUID AND SOLID PHASE TELLURIZATION OF ELECTROPLATED CADMIUM FILMS METAL INTO CADMIUM TELLURIDE.**

Robert Engelken, Charles Brinkley, Kwok Fai (Larry) Yu, and Lip Ngai (Steward) Chang, Arkansas State University, Department of Engineering, P.O. Box 1740, State University, AR 72467.

**\*PHOTOMODULATED CONTRAST AND IMAGING OF ELECTROPLATED SEMICONDUCTOR FILMS.**

Robert Engelken, Charles Brinkley, Kwok Fai (Larry) Yu, and Lip Ngai (Steward) Chang, Arkansas State University, Department of Engineering, P.O. Box 1740, State University, AR 72467.

**\*SCF-MO AND MONTE CARLO CALCULATIONS OF POLY (DIMETHYSILOXANE).**

Shannon H. Brownfield and Jerry A. Darsey, Department of Chemistry, University of Arkansas at Little Rock, Little Rock, AR 72204.

**\*INHIBITION OF PROTEOLYTIC ENZYMES BY LEUPEPTIN ANALOGS.**

Wanda Jones and Rose McConnell, Department of Chemistry, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

**\*ELECTROCHEMISTRY OF SOME NITRO-PHENYLFURANS.**

Himansu J. Vyas, Ali U. Shaikh, Department of Chemistry, University of Arkansas at Little Rock, Little Rock, AR 72204, and E. Kim Fifer, Department of Biopharmaceutical Sciences, University of Arkansas for Medical Sciences, Little Rock, AR 72205.

**\*DESIGN AND PERFORMANCE OF A VARIABLE WAVELENGTH FLAME INFRARED EMISSION DETECTOR FOR GAS CHROMATOGRAPHY.**

Weigun Zhang and M. Keith Hudson, Department of Electronics and Instrumentation, University of Arkansas at Little Rock, Little Rock, AR 72204.

**INFRARED-ABSORPTION PROPERTIES OF EL2 AND CARBON GaAs.**

Ju Zheng, University of Arkansas at Little Rock, Department of Electronics and Instrumentation, 2801 S. University, Little Rock, AR 72204.

**MODEL FOR THE CO POISONING OF HYDRODESULFURIZATION CATALYSTS. SYNTHESIS AND STRUCTURE OF  $[RU(CO)((PPH_3SCL_2H)_2)2CL_2] \cdot 2CH_3BR_2$ .**

Mark Draganjac, Thomas B. Rauchfuss, School of Chemical Sciences, 350C Noyes Lab, Box 21, 505 S. Mathews Ave., Urbana, IL 61801, and Arnold L. Rheingold, Department of Chemistry, University of Delaware, Newark DE 19716.

**USE OF CAPILLARY ZONE ELECTROPHORESIS TO FOLLOW THE DEGRADATION OF BENZYL PENICILLIN IN STOMACH ACID.**

Susan Arrowood and A.M. Hoyt, Jr., Department of Chemistry, University of Central Arkansas, Conway, AR 72035.

**DETERMINATION OF CIMETIDINE IN URINE BY CAPILLARY ZONE ELECTROPHORESIS.**

Susan Arrowood and A.M. Hoyt, Jr., Department of Chemistry, University of Central Arkansas, Conway, AR 72035.

**SYNTHESIS AND CHARACTERIZATION OF TWO MIXED ESSENTIAL METALLOELEMENT SALICYLATES.**

Wilfred M. Willingham and William M. Willingham, Department of Chemistry, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

**STRUCTURAL EVIDENCE OF A MONOMERIC COPPER (II) BENZOATE PYRIDINE COMPLEX  $[Cu(II)(C_6H_5O_2)_2(C_5H_5N)_2]$ .**

Elsie Williams, Shaheen Khan, and William M. Willingham, UAPB Research Center, University Drive, Pine Bluff, AR 71601.

**PHYSICS, MATH, ENGINEER, GEOLOGY**

Chairman: Dean C. Hirschi, and Rahul Mehta  
University of Central Arkansas

**FORECASTING WITH ARTIFICIAL NEURAL NETWORKS.**

S. Malasri, L.Y. Lin, and P. Orono, Christian Brothers University, Memphis, TN 38104.

Arkansas Academy of Science

LEAST-SQUARES POLYNOMIAL FILTERS.

D.G. Sam Synder, Department of Mathematics and Physics, University of Arkansas at Monticello, Monticello, AR 71655.

A MULTIPLE SAMPLE CRYOSTAT FOR THE DETERMINATION OF SUPERCONDUCTOR PROPERTIES.

G. Burnside, R.M. Hawk, P.C. McLeod, Department of Electronics and Instrumentation, University of Arkansas at Little Rock, Little Rock AR 72204.

ELECTROSTATIC GRANULAR FILTER. SONGPING GAO.

Kevin Tennial, and Malay Mazumder, Department of Electronics and Instrumentation, University of Arkansas at Little Rock, 2801 S. University, Little Rock, AR 72204.

SYNTHETIC MULTIGATE DOPPLER SYSTEM.

Reagan Cole and Al Adams, University of Arkansas at Little Rock, Electronics and Instrumentation Department, 2801 S. University, Little Rock AR 72204.

REAL TIME MULTIPLE PARTICLE AERODYNAMIC SIZE AND CHARGE MEASUREMENTS BY PARTICLE MOTION IMAGE ANALYSIS.

Charles Mu and Malay K. Mazumder, Department of Electronics and Instrumentation, University of Arkansas at Little Rock, 2801 S. University Ave., Little Rock, AR 72204.

\*EXTERNAL CAVITY STRONG FEEDBACK FREQUENCY TUNABLE SEMICONDUCTOR LASERS,

Haiyin Sun, Department of Electronics and Instrumentation, University of Arkansas at Little Rock, 2801 S. University Ave., Little Rock AR 72204.

\*APPLICATION OF STABLE OPERATING CRITERION TO STRONG EXTERNAL FEEDBACK SEMICONDUCTOR LASERS.

Haiyen Sun, Department of Electronics and Instrumentation, University of Arkansas at Little Rock, 2801 South University Avenue, Little Rock, AR 72204.

\*THREE-DIMENSION MODELING OF THE EFFECT OF ATMOSPHERIC AEROSOLS ON THE GLOBAL TEMPERATURE.

Haiyin Sun and Malay K. Mazumder, Department of Electronics and Instrumentation, University of Arkansas at Little Rock, 2801 S. University Ave., Little Rock, AR 72204.

\*THE EVALUATION OF A PBSE LINEAR ARRAY AS AN INEXPENSIVE INFRARED LINE SCAN CAMERA SENSOR,

Jason Willis, Reagan Cole, David Wankum, and M. Keith Hudson, Department of Electronics and Instrumentation, University of Arkansas at Little Rock, Little Rock, AR 72204.

\*MEASUREMENT OF THE COEFFICIENT OF THERMAL EXPANSION OF SUPERCONDUCTING THIN FILMS USING POWDER X-RAY DIFFRACTION.

Biju Chandran, R.C. Goforth and S. Nasrazadani, Department of Mechanical Engineering, University of Arkansas, Fayetteville, AR 72701.

\*THIN FILM MECHANICAL PROPERTY MEASUREMENTS USING MICROMACHINED STRUCTURES.

Yau Kong Leong and R. Calvin Goforth, University of Arkansas, Mechanical Engineering Department, Fayetteville, AR 72701.

\*DEVELOPMENT OF MOUND MUDS IN A MIXED SILICICLASTIC/CARBONATE ENVIRONMENT.

John M. Ryan, Doy L. Zachry, Department of Geology, University of Arkansas, Fayetteville, AR 72701.

Saturday, April 4, 1992

CHEMISTRY: ORGANIC, BIOCHEMISTRY

Chairman: William S. Taylor, University of Central Arkansas

4-SUBSTITUTED ANILIDES OF 2,6- AND 5,6- DICHLORONICOTINIC ACID. POTENTIAL AGRICULTURAL AGENTS.

Frank L. Setliff and Nikhil G. Soman, Department of Chemistry, University of Arkansas at Little Rock, Little Rock, AR 72204.

HAMMETT CORRELATIONS IN THE <sup>1</sup>H NMR SPECTRA OF SOME N-ARYLDIHALONICOTINAMIDES.

Frank L. Setliff, Nikhil G. Soman, Jody Z. Caldwell and Debra L. Rogers, Department of Chemistry, UALR, Little Rock, AR 72204.

A PHOSPHOROUS-31 NMR STUDY OF THE COMPETITION FOR THE PREFERENTIAL BINDING OF LI<sup>+</sup>, MG<sup>2+</sup>, AND NA<sup>+</sup> TO ATP IN AQUEOUS SOLUTIONS.

Susan G. Brown and Roger M. Hawk, Electronics and Instrumentation Department, University of Arkansas at Little Rock, 2801 S. University, Little Rock, AR 72204, and Richard A. Komoroski, Departments of Radiology and Pathology, University of Arkansas for Medical Sciences, Little Rock, AR 72205.

\*SYNTHESIS OF LEUPEPTIN ANALOGS FOR PROTEINASE INHIBITION.

Melanie Frazier and Rose McConnell, Department of Chemistry, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

\*SYNTHESIS AND PEPSIN INHIBITION OF PEPSTATIN ANALOGS.

Anissa Evans and Rose McConnell, Department of Chemistry, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

\*OXAZOLIDINES DERIVED FROM EPHEDRINE AS POTENTIAL PRODRUGS.

Bridgette Samuels, Henri Linton, Jr., Lawrence Fitz and Richard Walker, Department of Chemistry, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

\*SYNTHESIS AND MUTAGENICITIES OF 3-SUBSTITUTED AND 3,5-DISUBSTITUTED 4-NITROPHENYLFURANS.

E. Kim Fifer and Robert M. Freeze, University of Arkansas for Medical Sciences, Little Rock, AR 72205; Ali Shaikh, University of Arkansas at Little Rock, Little Rock, AR 72204; and J.P. Freeman, National Center for Toxicological Research, Jefferson, AR 72079.

\*AQUEOUS RING-OPENING METATHESIS POLYMERIZATION OF 7-OXANORBORNENE SYSTEMS.

Tito Viswanathan and Jagdish Jethmalani, Department of Chemistry, University of Arkansas at Little Rock, Little Rock, AR 72204.

\*EFFECT OF EPHEDRINE ISOMERS ON LOCOMOTOR ACTIVITY IN RATS.

Lawrence Fitz, Henri Linton, Jr., Bridgette Samuels and Richard Walker, Chemistry Department, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

\*TESTED OVERHEAD PROJECTOR DEMONSTRATIONS FOR HIGH SCHOOL CHEMISTRY.

Linda E. Moss and J.E. Bennett, Arkansas State University, Department of Chemistry, P.O. Box 419, State University, AR 72467.

THE SYNTHESIS OF SULFONAMIDE DERIVATIVES OF SALICYLIC ACID.

Israt J. Chowdhury, Richard B. Walker, Shelton Fitzpatrick, J.P. Freeman, and William M. Willingham, Research Center, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601; Biology Department, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601;

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**Program**


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and National Center for Toxicological Research, Jefferson, AR 72079.

**PHYSICS AND GEOLOGY**

Chairman: Heather L. Woolverton, University of Central Arkansas

**\*COMPUTED GRAPHICAL REPRESENTATIONS OF THE GREGORIAN CALENDAR.**

Stephen R. Addison and Lee Ann Criswell, Department of Physics, University of Central Arkansas, Conway, AR 72035.

**\*VISUALIZING ELECTROSTATIC PHENOMENA USING MATHEMATICA.**

Eric Mayes, Department of Physics, Arkansas State University, State University, AR 72467.

**\*PROBLEMS IN THE DETECTION AND DELINEATION OF A CONTAMINATE PLUME FROM A LEAKING UNDERGROUND STORAGE TANK.**

Jay Sims, Department of Earth Science, University of Arkansas at Little Rock, 2801 S. University Ave., Little Rock, AR 72204.

**\*COMPARISON OF TWO MODELS FOR BREAKDOWN WAVES.**

Debra Burreis, Arkansas Tech University, 403 N. Cumberland Apt. "C", Russellville, AR 72801 and Mostafa Hemmati, Arkansas Tech University, Physics Department, Russellville, AR 72801.

**EVALUATION OF ANISOTROPY OF HYDRAULIC CONDUCTIVITY IN A FRACTURED BEDROCK AQUIFER USING STATISTICAL ANALYSIS METHODS.**

D. Michelle Williams, Department of Earth Science, University of Arkansas at Little Rock, 2801 S. University Ave., Little Rock, AR 72204.

**VERTEBRATE FOSSILS FROM THE SARATOGA CHALK (CAMPANIAN) OF SOUTHWESTERN ARKANSAS.**

John T. Thurmond, Department of Earth Science, University of Arkansas at Little Rock, 2801 S. University, Little Rock, AR 72204.

**COMPUTER MODELS OF EARTH'S MAGNETOSPHERE.**

Dean Hirschi, Department of Physics, University of Central Arkansas, Conway, AR 72035.

**THE SCHROEDINGER EQUATION WITH SPHERICALLY AVERAGED POTENTIALS.**

C.A. Hughes, Arkansas State University, Department of Physics, P.O. Box 70, State University, AR 72467.

**TECHNIQUES FOR EFFICIENCY CALIBRATION OF PHOTON DETECTORS FOR X-RAYS AND LOW ENERGY GAMMA RAYS.**

Rahul Mehta, Department of Physics, University of Central Arkansas, Conway, AR 72035.

**SCIENCE EDUCATION**

Chairman: Stephen R. Addison,  
University of Central Arkansas

**ON THE USE OF A TELESCOPE SIMULATOR TO TEACH ASTROPHYSICS AND INSTRUMENTATION IN ASTRONOMY.**

Stephen R. Addison, Department of Physics, University of Central Arkansas, Conway, AR 72035.

**WHAT RESEARCH SAYS TO THE SCIENCE TEACHER.**

Delena Tull, Department of Biology, University of Central Arkansas, 105 Lewis Science Center, Conway, AR 72035.

**BIOTECHNOLOGY CURRICULUM DEVELOPMENT FOR UNDERGRADUATE BIOLOGY.**

Maurice G. Kleve, Dennis A. Baeyens, Alvan A. Karlin, Thomas J. Lynch and James H. Peck, Department of Biology, University of Arkansas at Little Rock, Little Rock, AR 72204.

**CRITICAL THINKING WITH BOTANY: USE OF ALIEN LIFE FORMS (ALFS) AS TEACHING EXEMPLARS.**

James H. Peck, Department of Biology, University of Arkansas at Little Rock, Little Rock, AR 72204.

**ARKANSAS MATH CRUSADE.**

Dr. Frank James, Department of Mathematics, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

**COLLABORATIVE LEARNING IN DESIGN COURSES.**

Robert L. Douglas, Memphis State University, Memphis, TN 38152.

**IMPAC - PHASE II TECHNOLOGY BASED PROGRAM IN K-12 EDUCATION.**

Cecil W. McDermott, IMPAC Learning Systems, Inc., 501 Woodlane Drive, Suite 122, Little Rock, AR 72201.

**THE ARKANSAS SCHOOL FOR MATHEMATICS AND SCIENCE: A STATUS REPORT.**

John W. Ahlen, Arkansas Science and Technology Authority, 100 Main Street, Suite 450, Little Rock, AR 72201.

**PROJECT ADVISE (ALLIANCE FOR THE DEVELOPMENT OF THE VISION AND INITIATIVE FOR SCIENCE EDUCATION IN ARKANSAS).**

Jannie Huffman, Department of Chemistry, Arkansas State University, State University, AR 72467.

**AQUATIC AND ENVIRONMENTAL BIOLOGY**

Chair John D. Rickett, University of Arkansas at Little Rock

**CHARACTERIZATION OF BENTHIC COMMUNITIES OF LEAST DISTURBED STREAMS IN ARKANSAS' ECOREGION.**

Roland E. McDaniel, FTN Associates, Ltd., 3 Innwood Circle, Suite 220, Little Rock, AR 72211.

**LABORATORY SURROGATE OR REAL WORLD CHARACTERIZATION: TOXICITY TESTING VS. RAPID BIOASSESSMENT.**

R.E. McDaniel, FTN Associates, Ltd., Little Rock, AR 72211 and A.D. Price, Arkansas Department of Pollution Control and Ecology, 8001 National Drive, Little Rock, AR 72209.

**ARKANSAS' RAPID BIOASSESSMENT PROGRAM: ITS LIFE, ITS VALUE AND ITS UNTIMELY DEMISE.**

Alan D. Price, Arkansas Department of Pollution Control and Ecology, 8001 National Drive, Little Rock, AR 72209; and Roland E. McDaniel, Fr:N Associates, Ltd., 3 Innwood Circle, Suite 200, Little Rock, AR 72211.

**BACTERIOLOGICAL WATER QUALITY OF BEAVER RESERVOIR, ARKANSAS, 1991.**

J.D. Bragg and Mark E. Clark, Biology Department, Henderson State University, HSU Box 7853, Arkadelphia, AR 719990001.

**PHYTOPLANKTON COMMUNITY STRUCTURE IN DARDANELLE RESERVOIR, 1981-1990.**

John D. Rickett and Robert L. Watson, Biology Department, University of Arkansas at Little Rock, Little Rock, AR 72204.

**ZOOPLANKTON COMMUNITY STRUCTURE IN DARDANELLE RESERVOIR, 1981-1990.**

John D. Rickett and Robert L. Watson, Biology Department, University of Arkansas at Little Rock, Little Rock, AR 72204.

## Arkansas Academy of Science

THE POPULATION DYNAMICS OF *CLINOTOMUM MARGINATUM* (YELLOW GRUB) IN SMALLMOUTH BASS FROM A NORTH ARKANSAS STREAM.

James J. Daly, Jimmy C. Almond, Department of Microbiology and Immunology, University of Arkansas for Medical Sciences, Little Rock, AR 72205; and William Jennings, Arkansas Game and Fish Commission, Cotter, AR 72626.

## AQUATIC MACROINVERTEBRATE FAUNA OF THE WHITE RIVER NATIONAL WILDLIFE REFUGE.

Stephen W. Chordas III and George L. Harp, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

## \*AQUATIC INSECTS ASSOCIATED WITH SNAG HABITATS IN NORTHWEST ARKANSAS STREAMS.

Edward C. Phillips and Raj V. Kilambi, University of Arkansas, 632 Science-Engineering Building, Fayetteville, AR 72701.

## \*CRYSTENOTHERMAL ALGAE.

Lynda E. Husted and Richard L. Meyer, University of Arkansas, Department of Biological Sciences, Fayetteville, AR 72701.

## \*DEVELOPMENTAL MORPHOLOGY IN CIRCULAR DESMIDS.

Jeanette K. Phillips and Richard L. Meyer, Department of Biological Sciences, University of Arkansas, Fayetteville, AR 72701.

## USING PHYSICAL, CHEMICAL AND BIOLOGICAL INDICATORS TO ASSESS WATER QUALITY ON THE OUACHITA NATIONAL FOREST, UTILIZING BASIN AREA STREAM SURVEY (BASS) METHODS.

J. Alan Clingenpeel, Ouachita National Forest, P.O. Box 1270, Hot Springs, AR 71902, and Betty G. Cochran, Ouachita National Forest, P.O. Box 369, Glenwood, AR 71043.

## VERTEBRATE ZOOLOGY

Chairman: Alvan A. Karlin, University of Arkansas at Little Rock

\*REPRODUCTION IN THE WESTERN MUD SNAKE, *FARANCIA ABACURA REINWARDTII* (SERPENTES: COLUBRIDAE), IN ARKANSAS.

John W. Robinette and Stanley E. Trauth, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

\*GENETIC RELATIONSHIPS BETWEEN THREE SPECIES OF *NOTURUS* (FAMILY: ICTALURIDAE).

John L. Harris, Arkansas Highway Department, Little Rock, AR 72203; Alvan A. Karlin, J. Todd Blake, and Robbin L.G. Long, University of Arkansas at Little Rock, Little Rock, AR 72204; Henry W. Robison, Department of Biological Sciences, Southern Arkansas University, Magnolia, AR 71753; and Betty G. Cochran, U.S. Forest Service, Ouachita National Forest.

BIOLOGY OF *ERIMYSTAX DISSIMILIS* (PISCES: CYPRINIDAE) IN THE WHITE RIVER DRAINAGE, ARKANSAS.

John L. Harris, Environmental Division, Arkansas Highway and Transportation Department, P.O. Box 2261, Little Rock, AR 72203.

DISTRIBUTIONAL SURVEY OF THE BIRD-VOICED TREEFROG, *HYLA AVIVOCA* (ANURA: HYLIDAE), IN ARKANSAS.

Stanley E. Trauth, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

DISTRIBUTION OF THE SOUTHERN RED-BACKED SALAMANDER, *PLETHEDON SERRATUS* (CAUDATA: PLETHEDONTIDAE), IN THE OUACHITA MOUNTAIN REGION OF ARKANSAS.

M.D. Fletcher, B.G. Cochran, S.E. Trauth, and D. Saugey, Arkansas State University, (MDF, SET), P.O.B. 599 State University, AR 72467, U.S. Forest Service, (BGC) Glenwood, AR 71943, (DAS) Jessieville, AR 71949.

STATUS OF THE OZARK HELLBENDER, *CRYPTOBRANCHUS BISHOPI* (URODELA: CRYPTOBRANCHIDAE), IN THE SPRING RIVER, FULTON COUNTY, ARKANSAS.

Stanley E. Trauth, J.D. Wilhide, and Patrick Daniel, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

## \*MIGRANT SPECIES COMPOSITION AND DIVERSITY OF HAWK POPULATIONS IN NORTHEAST ARKANSAS 1991-92.

Heath Garner and E.L. Hanebrink, Arkansas State University, 408 Campus, Jonesboro, AR 72401.

## \*FOOD HABITS OF THE COMMON BARN OWL IN WESTERN ARKANSAS.

Rhonda M. Huston and Thomas A. Nelson, Department of Biological Sciences, Arkansas Tech University, Russellville, AR 72801.

## \*SEQUENTIAL OCCUPATION OF CAVITIES BY RED-COCKADED AND RED-BELLIED WOODPECKERS.

Joseph C. Neal, Arkansas Coop. Research Unit, University of Arkansas, Fayetteville, AR 72701; Warren G. Montague, Poteau Ranger District, USDA Forest Service, P.O. Box 2255, Waldron, AR 72958; and Douglas A. James, Department of Biological Sciences, University of Arkansas, Fayetteville, AR 72701.

## \*BEHAVIORAL ECOLOGY OF AN URBAN POPULATION OF GRAY SQUIRRELS.

Kevin M. Crawford and William H. Baltosser, Department of Biology, University of Arkansas at Little Rock, Little Rock, AR 72204.

BANDING DATA OF THE LITTLE BROWN BAT, *MYOTIS LUCIFUGUS*, IN ARKANSAS.

Doug Fletcher, J.D. Wilhide, Betty Cochran, and R.B. McAllister, Arkansas State University, P.O. Box 599, State University, AR 72467 and U.S. Forest Service, P.O. Box 369, Glenwood, AR 72943.

## A MATERNITY COLONY OF GRAY BATS IN A NON-CAVE SITE.

Lorraine Timmerman, Rt. 2 Box 257N, Mena, AR 71953; and V.R. McDaniel, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

DISTRIBUTION AND STATUS OF RAFINESQUE'S BIG-EARED BAT, *PLECOTUS RAFINESQUII*, IN ARKANSAS.

Daniel R. England, David A. Saugey, Laura R. Chandler, V. Rick McDaniel, Marsha C. Rowe, Department of Biology, Southern Arkansas University, Magnolia, AR 71753, United States Forest Service, Ouachita National Forest, Jessieville, AR 71949, Department of Biology, University of Arkansas at Little Rock, Little Rock, AR 72204, Department of Biology, Arkansas State University, State University, AR 72467, Stamps High School, Stamps, AR 71860.

## LONG-TERM WHITE-TAILED DEER HARVEST TRENDS FOR THE SOUTHEASTERN UNITED STATES.

R.A. Kluender and P.E. Tappe, University of Arkansas at Monticello, Monticello, AR 71655; and M.L. Cartwright, AR Game and Fish Commission, Mt. View, AR 72560.

AGE SPECIFIC ANALYSIS OF FOOD HABITS FOR ARKANSAS RACCOONS (*PROCYON LOTOR*). J.D. WILHIDE,

V.R. McDaniel, Department of Biological Sciences, Arkansas State University, State University, AR 72467 and Renn Tumblison, Department of Biology, Henderson State University, Arkadelphia, AR 71923.

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 Program
 

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NEW RECORDS OF VERTEBRATES IN SOUTHWEST ARKANSAS.  
Renn Tumilson, Mark Karnes, and Mark Clark, Department of Biology, Henderson State University, Arkadelphia, AR 71999; The Ross Foundation, P.O. 335, Arkadelphia, AR 71923.

**MICROBIOLOGY AND MOLECULAR BIOLOGY**

Chairman: Steven W. Runge, University of Central Arkansas

CHARACTERIZATION OF SIMIAN VARICELLA VIRUS DNA AND VIRAL GENE EXPRESSION.

Nanette J. Gusick and Wayne L. Gray, Department of Microbiology and Immunology, University of Arkansas for Medical Sciences, Little Rock, AR 72205.

SIMIAN VARICELLA VIRUS (SVV) AND VARICELLA ZOSTER VIRUS (VZV) POSSESS HOMOLOGOUS GLYCOPROTEIN AND IMMEDIATE EARLY GENES.

C.Y. Pumphrey, T.M. Fletcher, and W.L. Gray, Department of Microbiology and Immunology, University of Arkansas for Medical Sciences, Little Rock, AR 72205.

\*A SOIL ARTHROBACTER ISOLATE WITH PROMISE FOR ENVIRONMENTAL TOXINS CLEANING.

John Freeman and Lawrence M. Mwasi (sponsor), Department of Biology, University of Arkansas at Pine Bluff, Pine Bluff, AR 71601.

\*GENE SEQUENCING OF UDP-GLUCONOSYLTRANSFERASES.

Ashley Shannon Bean, Hendrix College, Conway, AR 72032.

SYNTHESIS AND PURIFICATION OF SHORT STRANDS OF RNA USING T7 RNA POLYMERASE.

Susan G. Cady, Chemistry Department, Arkansas State University, State University, AR 724670419 and Neocles B. Leontis, Chemistry Department, Bowling Green State University, Bowling Green, OH 43403-0213.

UV7-INDUCED CHROMOSOMAL BREAKS AND THE DNA REPLICATION FORK.

Dan Yoder, M. Rachel McDowell, and Gaston Griggs, Biology Department, John Brown University, Siloam Springs, AR 72761.

DETECTING MUTATIONS WITH DENATURING GRADIENT GEL ELECTROPHORESIS.

R.A. Mittelstaedt and R.H. Heflich, National Center for Toxicological Research, Jefferson, AR 72079.

REGULATION OF ADULT MYOBLAST-SPECIFIC GENE EXPRESSION.

Charlotte A. Peterson and Jane M. Taylor, Department of Medicine, University of Arkansas for Medical Sciences, 4301 West Markham Street, Little Rock, AR 72205.

STRUCTURE AND FUNCTION OF TRP REPRESSOR OF *E. COLI*.

Barry K. Hurlburt, Department of Biochemistry and Molecular Biology, University of Arkansas for Medical Sciences, 4301 W. Markham Street, Little Rock, AR 72205.

PARTIAL PURIFICATION OF A *BRUCELLA ABORTUS* CHAPERONIN.

R.M. Roop II, L. Hendrix and G. Jones, Department of Microbiology and Immunology, University of Arkansas for Medical Sciences, Little Rock, AR 72205.

CHARACTERIZATION OF THE ACTIVE SITE OF TRYPTOPHANYL-TRNA SYNTHETASE.

Kim Chan and Roger Koeppel II, Department of Chemistry and Biochemistry, University of Arkansas, Fayetteville, AR 72701.

CHARACTERIZATION OF THE GENES ENCODING THE *BRUCELLA ABORTUS* CPN10 AND CPN60 PROTEINS.

R.M. Roop II, A. Wagoner, M. Gee and M. Shaw, Department of Microbiology and Immunology, University of Arkansas for Medical Sciences, Little Rock, AR 72205.

CLONING AND EXPRESSION OF A 66,000 DALTON IMMUNOREACTIVE *BRUCELLA ABORTUS* PROTEIN IN *ESCHERICHIA COLI*.

R.M. Roop II, M.L. Price and T.W. Fletcher, Department of Microbiology and Immunology, University of Arkansas for Medical Sciences, Little Rock, AR 72205.

DOCUMENTED AIDS CASES AND A PROJECTED RATE FOR ADOLESCENCE HIV INFECTIONS IN THE UNITED STATES.

R.R. Goforth, Computer Systems Engineering, University of Arkansas, Fayetteville, AR 72701.