

**OKLAHOMA ACADEMY OF SCIENCE**  
Office of the  
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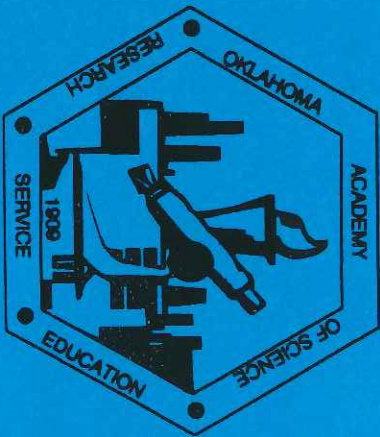
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**OFFICIAL PROGRAM  
OF THE  
84TH ANNUAL TECHNICAL MEETING**

**OKLAHOMA  
ACADEMY OF SCIENCE**

Affiliated with the  
American Association for the Advancement of Science



**FRIDAY  
November 3, 1995**

**NORTHWESTERN OKLAHOMA STATE UNIVERSITY  
Alva, Oklahoma**

# OKLAHOMA ACADEMY OF SCIENCE

Established in 1909

"The purpose of the Academy shall be to stimulate scientific research; to promote fraternal relationship among those engaged in scientific work in Oklahoma; to diffuse among the citizens of the State a knowledge of the various disciplines of science; and to investigate and publicize the human, natural and educational resources of the State."

## Article I, Section 2 OAS Constitution

### Activities of the Academy

- Publishes the Proceedings of the Oklahoma Academy of Science, Annals of the Oklahoma Academy of Science and Transactions of the Oklahoma Junior Academy of Science
- Hosts the Annual Technical Meeting for the presentation of scientific papers by both professional and collegiate scientists
- Sponsors symposia on selected topics of timely and vital interest to the State and Nation
- Arranges spring and fall field meetings in varied biogeographic regions of the State
- Coordinates and promotes the activities of the Oklahoma Junior Academy of Science
- Supervises the activities of the Oklahoma Collegiate Academy of Science
- Provides research grants and scholarship awards to outstanding proposals submitted by secondary school and undergraduate college students
- Provides scientific consultation services to governmental and private agencies throughout the State

## EIGHTY-FOURTH ANNUAL TECHNICAL MEETING OKLAHOMA ACADEMY OF SCIENCE NORTHWESTERN OKLAHOMA STATE UNIVERSITY

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# THE OKLAHOMA ACADEMY OF SCIENCE

## Northwestern Oklahoma State University

Alva, Oklahoma

### 84TH ANNUAL FALL TECHNICAL MEETING

#### Program Summary

**Thursday, 02 November 1995**  
Executive Council Dinner and Meeting  
BLG & RM #  
East Ranger Room  
Student Union

**Friday, 03 November 1995**  
Registration for Technical Meeting  
7:30 a.m. - 3:00 p.m.  
Registration Junior Academy Workshop  
7:30 a.m. - 11:00 a.m.  
East Ranger Room  
Herod Hall Auditorium

8:00 a.m. - 8:45 a.m. Committee Meetings (if scheduled)  
9:00 a.m. - 11:00 a.m. Concurrent Scientific Paper Sessions  
See p. 21

	BLG & RM #	Section	BLG & RM #
Section A Botany	SC 203	Section A Zoology	SC 206
Section B Geology	SC 207	Section C Physical Sciences	SC 102
Section D Social Science	SC 110	Section E Science Education	SC 208
Section F Geography	SC 108	All Sections Posters	W. Ranger Rm
Section G Fish and Wildlife	SC Amphitheater	Section H Microbiology	SC 209
Section I Engineering Sciences	CH 209	Section J Biochemistry/Biophysics	CH 105
Section K Microscopy	CH 205	Section L Math/Computer Science	CH 108
Section M Environmental	SC 211	Section N Biomedical Sciences	SC 210
Section Z Junior Academy	Workshop on Student Research	Herod Hall Auditorium	
SC= Science Building		CH= Carter Hall	
11:00 a.m. - 11:15 a.m.	Section Meetings in assigned meeting rooms listed above.		
11:20 a.m. - 11:50 a.m.	Participate in the election of Section Vice Chair		
	All OAS members are encouraged to attend and visitors are welcome.		
12 noon - 4:30 p.m.	OAS BANQUET Student Center Ballroom		
	Admission by ticket only. Tickets available at registration.		
	Dr. Paul Nighswonger, Professor of Biology, NWOSU		
	"Interdisciplinary Aspects of The Ecology of NW Oklahoma"		
2:00 p.m. - 5:00 p.m.	Concurrent Scientific Paper Sessions Continuation		
Special Section Fire Arts 211	Oklahoma Partners for Biological Science		

#### OAS NAME BADGES

An OAS name badge, obtained by registering, is required for all individuals attending Academy workshops, meetings and banquet. All presenters must register and wear an official name badge.

### GENERAL INFORMATION

**Parking:** OAS parking at Northwestern Oklahoma State University will be clearly marked and is identified on the map on the inside back cover to assist you in locating it. parking is free to all NWOSU visitors on that day.

**Preregistration:** Preregistration assists greatly in planning to accommodate a large influx of visitors. Preregistration will continue until October 30, 1995. If you have not yet done so, please, utilize the preregistration form on p. 28 of this booklet. Preregistration is a means by which you can save a little of the expense of attending this meeting. The cost will increase on November 3rd. Banquet tickets may not even be available, but, they usually are, and every effort will be made to enable you to obtain one at the last minute.

**On-site Registration Fees:** Members--\$15.00, Non-members--\$20.00, Students \$10.00, Banquet Tickets (if available) \$15.00

**1995 and 1996 Dues are Payable:** The OAS registration desk will accept dues payments.  
Regular--\$25.00, Student--\$5.00, Family--\$30.00  
Library--\$27.50, Sustaining--\$100.00, Life--\$300.00

**Academy Business Meeting:** The 84th Annual Business Meeting of the Oklahoma Academy of Science will be held in the Science Hall Amphitheater at 11:20 a.m.

**Academy and Award Banquet:** This gala affair will begin at noon Friday in the Student Union Ballroom. There will be a special speaker and award presentations.

**Guidelines for Paper Publication:** Papers may be published in the Proceedings of the Oklahoma Academy of Science, subject to the editorial policies as stated in POAS 74.ii and 64-74, and review of the Editorial Board. Manuscripts, an original and two copies of printed papers; or alternatively manuscripts may be submitted on computer disk or transmitted as an e-mail document. Mail to Dr. Franklin R. Leach, Editor, POAS, Department of Biochemistry and Molecular Biology, 246B Noble Research Center, Oklahoma State University, Stillwater, OK 74078-0454. E-mail: firefly@bmb-fs1.biochem.okstate.edu Manuscripts received after December 15, 1995 will be accepted for publication in November 1996. OAS members are charged \$30-\$35 per page and non-members are charged \$90-\$105 per page.

**Executive Secretary-Treasurer:** Inquires concerning upcoming OAS activities and membership may be directed to Executive Secretary -Treasurer: P. O. Box 701915, Tulsa, Oklahoma 74170-1915. E-mail: enelson@oru.edu

**Refreshments:** will be served only in designated areas adjacent to the meeting rooms from 8:00 - 10:30 a.m. and from 2:00-3:30 p.m.



**Motel Accommodations:** The headquarters motel for the 84th Annual Technical Meeting will be the Vista Motel, 14th and Oklahoma Boulevard, Alva OK 73717. (405) 327-3232.

Telephone for reservations and rate confirmation. Inform the desk that you are an OAS delegate. The quoted rates are single \$20.00 plus tax, double \$26.00 plus tax. Other discounts may apply.

Other fine motels in the vicinity of NWOSU.

Motel	Address	Single	Double	Phone
Ranger Inn	420 Oklahoma Boulevard	\$32+ tax	\$36+ tax	327-1981
Holiday Inn	701 E Oklahoma Blvd.	\$28+ tax	\$30+ tax	327-3333
Townsmen Inn	105 Oklahoma Blvd.	\$23+ tax	\$30+ tax	327-0431
Western Motel	608 E Oklahoma Blvd.	\$28+ tax	\$35+tax	327-1363

**Assistance or Information:** Look for individuals with OAS badges or host ribbons. These are NWOSU faculty and staff assigned to assist you.

**Name Badges:** Name badges, provided upon registration, must be worn by all individuals at all times attending Academy sectional programs, business meetings, and banquet. Without displaying an OAS identification you may be asked to leave by the persons in charge. Lost badges may be replaced at the registration desk upon verification of your registration documents.

**Official Program:** Bring this program booklet with you. Additional copies may be purchased for \$1.00 at the registration desk.

**1996 Spring Field Meeting:** This meeting will be held in April 1996. The State parks cannot be reserved before January 1st therefore the exact date is not known at this time. This Program is being planned by Ron Suttles, Oklahoma Department of Wildlife Conservation, 1801 N Lincoln Blvd., Oklahoma City, OK 73105. (405) 521-4602. If you have any suggestions for field trips or questions about facilities Ron is the person to call. Details will be forthcoming in the February 1996 Newsletter.

**1996 Fall Field Meeting:** This meeting is planned for September 1996. The program is being developed by Dr. Stanley Fox, Department of Zoology, Oklahoma State University, Stillwater, OK 74078. (405) 744-5555. If you have any suggestions for field trips or questions about facilities Stan is the person to call. Details will be forthcoming in the August 1996 Newsletter.

**1996 Annual Technical Meeting:** We are still without a host school for this meeting. Please, consider inviting us to your campus at the Annual Business meeting.

**No Smoking:** Please, no smoking in any of the buildings on the campus. Also food and drink are not permitted in any meeting room. Thank you.

## SECTION A: BIOLOGICAL SCIENCES - BOTANY 203 SCIENCE BUILDING

**MODERATOR: GREGG HUMPERT ROBINSON**

- 9:00 Beta-galactosidases of ripening chile. Charlie L. Biles and Benny D. Bruton, ECU.
- 9:15\* Peroxidases of frozen sweet corn. Kim Collings, ECU.
- 9:30 Textile dyes from Oklahoma plants. Lynne Richards, Ronald J. Tyril, and Ghislieli Ramirez-Tate, OSU.
- 9:45 BREAK
- 10:00 The vascular flora of a granitic outcrop in Johnston County, Oklahoma. Kimberly A. Shannon, OSU.
- 10:15 Herbaceous plants and communities of the McCurtain County Wilderness Area. Bruce A. Smith, Ronald E. Masters, and Ronald J. Tyril, OSU.
- 10:30 The vascular flora of Boehler Seeps and Sandhills Preserve, Atoka County. Linda C. Gatti-Clark and Ronald J. Tyril, OSU.
- 10:45 Oklahoma vascular plants, additions and distribution comments. Constance E. S. Taylor (presenter, SEOSU), Lawrence Magrath, Patricia Folley, and Sydney Carpenter.
- 11:00 SECTION A, BIOLOGICAL SCIENCES MEETING in this room.
- 11:20 OAS BUSINESS MEETING, SC amphitheater.
- 1:45 **MODERATOR: SUZANNE MCALLISTER**  
Effects of varied initial species richness on resulting species richness in terrestrial plant microcosms. Karol Ezell, OSU.
- 2:00 Investigations on small scale patterns and processes in a Mediterranean dwarf rush community. Reinhard Spiegelhauser, OSU.
- 2:15 Vegetative regulation of soil phosphorus dynamics in the northern Chihuahuan Desert. Anne Fernald Cross, OSU.
- 2:30 BREAK
- 2:45 Patterns of plant species distribution in playa lake basins. Bruce Hoagland, OK Biological Survey.
- 3:15 The Flora of Oklahoma Project Meeting.

SECTION A: BIOLOGICAL SCIENCES - ZOOLOGY  
206 SCIENCE BUILDING

MODERATOR: TROY BAIRD

- 9:00\* A case of polypodism in *Mus musculus*, with a description of the anatomy and physiology. Michael D. Brown, Cameron University.
- 9:15\* Sight and sound census of *Pharomachrus mocinno* in the Sevrege River watershed, San Gerardo de Dota, Costa Rica. Paul W. Denton, Southern Nazarene University.
- 9:30\* An inventory of species and interactions in the Savegre River, San Gerardo de Dota, Costa Rica. Richard S. Sawin, Southern Nazarene University.
- 9:45 BREAK
- 10:00 Starvation during tadpole development: help or hinderance? Kevin Ruff and John M. Hranitz, UCO.
- 10:15 Increased aggression at oviposition: do female collared defend nesting site? Chris L. Sloan & Troy A. Baird, UCO.
- 10:30 Annual variation in multiple clutch production in female collared lizards. Troy A. Baird and Chris L. Sloan, UCO.
- 10:45 The genetics of adult and hatchling collared lizards in a patchy environment. John M. Hranitz & Troy Baird, UCO.
- 11:00 SECTION A, BIOLOGICAL SCIENCES MEETING, in room 203.
- 11:20 OAS BUSINESS MEETING, SC amphitheater.
- MODERATOR: LANCE WILLIAMS
- 1:45 Updating information on the Red River Pupfish and the Arkansas River Shiner. Jimmy Piggy and Robert Gibbs, OK Department of Environmental Quality.
- 2:00 Food-hoarding and cache retrieval in the Thirteen-lined Ground Squirrel, *Spermophilus tridecemlineatus*. Linda D. Luna, UCO.
- 2:15 Sex ratio study of *Myotis velifer* in western Oklahoma. Lynda M. Samanie, UCO.
- 2:30 BREAK
- 2:45 Bison grazing patterns on seasonally burned tallgrass prairie in Oklahoma. Bryan Coppedge & James Shaw, OSU.
- 3:00 A pre-Columbian Celtic Irish navigator on the Cimarron River. Troy C. Dorris, OSU.
- POSTER SESSION - all sections - W. Ranger Room.

SECTION B: GEOLOGY  
SCIENCE BUILDING, ROOM 207

MODERATOR: DR. JOHN P. HOGAN, UNIVERSITY OF OKLAHOMA

Morning Session:

- 9:00 Designation of a neostatotype for the Savanna Formation in its type area. Pittsburg County, Oklahoma. LeRoy A. Hemish, (OGS).
- 9:20 Environmental Geophysics at Aberdeen Proving Ground, Maryland. Carl R. Daudt, Phillips University, Oklahoma.
- 9:40 Recent seismicity in north-central, Oklahoma. Kenneth V. Luza, (OGS).
- 10:00 Thermal modelling of diabase dike emplacement at Elmer Thomas Dam, Wichita Mountains, Oklahoma. J. D. Price, J. P. Hogan, and M. C. Gilbert, (OU).
- 10:20 Break
- 10:30 Thermal conductivity of coal. Matthew Herrin and David Denning, (OU).
- 10:50 Subsurface temperature and overpressure in the Anadarko Basin, southwestern Oklahoma. Youngmin Lee and David Denning, (OU).
- 11:10 Paleocology of Late Carboniferous and Early Permian Ammonoids. Darwin R. Boardman III, (OSU), David Work, (IU), Royal H. Maples, (UO).
- 11:30 Paleoenvironmental analysis of dark gray to black shales from outcropping latest Carboniferous-Early Permian cyclothem in the Midcontinent based on microfossil distributions. Michael R. Daugherty and Darwin R. Boardman III, (OSU).
- 11:50 Lunch.



**SECTION B: GEOLOGY**  
**SCIENCE BUILDING, ROOM 207**  
**MODERATOR: DR. JOHN P. HOGAN, UNIVERSITY OF OKLAHOMA**

**Afternoon Session:**

- 1:20 Recognition, stratigraphic distribution, and significance of paleosols in the geologic record. James R. Chaplin, (OGS)
- 1:40 Petrography and geochemistry of the igneous rock type "Monzonite" from the type locality in Italy. H.G. Huchenthal, (OU).
- 2:00 Petrographic and paleontological analysis of the Howard Cyclothem in Chautauqua County, Kansas. Memet Kont (OSU)
- 2:20 Thrust perception: using cognitive maps to reveal stakeholder perspectives. Suzanne McClendon and Will Focht, (OSU).
- 2:40 Geometry of thrust faults in the Frontal Ouachita Mountains around Harshorne area. Ala Sagnak, (OSU).
- 2:45 The potential of morphing technology in earth science education. Vernon P. Scott (OSU)
- Poster: On the thermal regime of the Transylvanian Basin, Romania. Constantin Cranganu and Dr. David Demming, University of Oklahoma

**SECTION C: PHYSICAL SCIENCES**  
**SCIENCE BUILDING, ROOM 102**  
**MODERATOR: JOHN A. GUTHRIE, UCO**

- 9:00 a.m. A novel laboratory approach for determining uniform acceleration utilizing Doppler shift measurements. Alahakone Dinel and Roger D. Hartman, ORU.
- 9:15 a.m. \*An improved Kundt's tube for determining heat capacity ratios ( $\gamma$ 's) of gases. Timothy W. Pease and Roger D. Hartman, ORU.
- 9:30 a.m. \*Molecular characterization of phospholipase C8 (PLC8) in bovine retina. April R. Carpenter, UCO.
- 9:45 a.m. The quantum balanced pencil redux, James S. Meyer, St. Gregory's College.
- 10:00 a.m. A closed-cycle CW photolytic iodine laser using t-C<sub>4</sub>F<sub>9</sub>l. John A. Guthrie, UCO.
- 10:15 a.m. Section C Business Meeting.
- 10:20 a.m. End of session.
- 11:20 a.m. All Academy Business Meeting, Science Building Amphitheater.
- 12:00 noon Banquet, Student Center Ballroom.
- \*Collegiate Academy presentation.

**SECTION D: SOCIAL SCIENCES**

**SCIENCE BUILDING, ROOM 110**

**MODERATOR: DON G. WYCKOFF**

- 9:30 a.m. Human Antiquity in Northwestern Oklahoma: The Burnham Enigma. Don G. Wyckoff, O.U.
- 9:45 a.m. Yet Another Archeological Survey in Northeastern Oklahoma. Lois E. Albert, O.U.
- 10:00 a.m. The Craft Cache: A Prehistoric Tool Kit. Jesse Ballenger, O.U.
- 10:15 a.m. Economic Specialization and the Development of Prehistoric Horticultural/Bison Hunting Societies in South-Central Oklahoma. Richard R. Drass, O.U.
- 10:30 a.m. The Case for Sedentism among Southern Plains Villagers. Robert L. Brooks, O.U.
- 10:45 a.m. Agribusiness and Antitrust Policies: Does Anyone Care? Thomas D. Watts, U. Texas-Arlington.
- 11:00 a.m. Section D Business Meeting

**SECTION E: SCIENCE EDUCATION**

**SCIENCE BUILDING, ROOM 208**

**MODERATORS: DAVID W. LOLLIS & STEPHANIE MEIDL**

- 9:00 Environmental soil exercises for general education students. Dale Williams, St. Cloud State University.
- 9:15 The conversion of aluminum to alien: a macro-scale synthesis in zipper bags. Gordon L. Eggleton, Sharon A. Lawson, and Barbara Riggs, SEOSU.
- 9:30 Correlation of spatial visualization, spatial orientation, and flexibility of closure with microbiology achievement. P. Alan Lennon, SEOSU.
- 9:45 Harmony, ratios, and proportions. Verbal Snook and Roger D. Hartman, ORU.
- 10:10 Section E Business Meeting.
- 10:20 End of Session.

SECTION F: GEOGRAPHY  
SCIENCE BUILDING ROOM 108  
MODERATOR: LALLIE F. SCOTT

- 9:00 a.m. Geographic characteristics of canoeing and kayaking in the United States. Thomas Wike, OSU.
- 9:20 a.m. The socioeconomic transformation of Delaware County, Oklahoma. Charles T. Ziehr, NSU.
- 9:40 a.m. Preliminary results of a survey of lead and zinc in grasses over the Picher Mining Area. Lallie F. Scott, NSU.
- 10:00 a.m. Patterns from the Federal Survey and Assessment of Townsites in the Cherokee Nation, 1902-04. Brad A. Bays, OSU.
- 10:20 a.m. Section F Business Meeting.
- 10:40 a.m. End of Session.

SECTION G: FISH AND WILDLIFE CONSERVATION  
SCIENCE BUILDING AMPHITHEATER  
MORNING SESSION  
MODERATOR: KEN CUNNINGHAM, ODWC

- 8:45 Influence of bias on sport fish population sampling at high verses low use areas in two eastern Oklahoma streams. Paul E. Balkenbush and William L. Fisher, Oklahoma Cooperative Fish and Wildlife Research Unit, OSU.
- 9:00 Percide fishes of the North Canadian River. Jim Pigg, DEQ.
- 9:15 Bioenergetics of smallmouth bass populations in two Oklahoma streams - a proposal. Greg L. Robel and William L. Fisher, Oklahoma Cooperative Fish and Wildlife Research Unit, OSU.
- 9:30 Species composition, including a new breeding record, of the Ralston Island heronry, Salt Plains National Wildlife Refuge. Marcus T. Koenen, Bryan R. Winton, and David M. Leslie, Jr., Oklahoma Cooperative Fish and Wildlife Research Unit, OSU.
- 9:45 Efficacy of electric fence enclosures for increasing nest success of least terns and snowy plovers at Salt Plains National Wildlife Refuge, Oklahoma. Bryan R. Winton and David M. Leslie, Jr., Oklahoma Cooperative Fish and Wildlife Research Unit, OSU.
- 10:00 Break
- 10:15 National Research Council published methionine requirements overestimate the methionine requirement of breeding northern bobwhite. Brad C. Dabbert and Robert L. Lochmiller, OSU.
- 10:30 Preliminary results suggest that predation may be limiting eastern wild turkey populations in southeastern Oklahoma. David S. Nicholson, Monte D. Stewart, Robert L. Lochmiller, David M. Leslie, Jr., and Ronald E. Masters, OSU.
- 10:45 Vegetative results concerning eastern wild turkey nesting success in southeastern Oklahoma. Monte D. Stewart, David S. Nicholson, Ronald E. Masters, Robert L. Lochmiller, and David M. Leslie, Jr., OSU.
- 11:00 Fish and Wildlife Conservation Section Business Meeting, Science Building Amphitheater
- 11:20 All Academy Business Meeting, Science Building Amphitheater
- 12:00 OAS BANQUET, Student Center Ballroom



SECTION G: FISH AND WILDLIFE CONSERVATION  
SCIENCE BUILDING AMPHITHEATER  
AFTERNOON SESSION  
MODERATOR: RON SUTTLES, ODBC

- 1:45 Grazing and tortoises: a review. Eric C. Hellgren, Richard T. Kazmaier, and Jaime C. Rutledge, OSU.
- 2:00 Conditions affecting aggression levels in a captive group of Diana monkeys (*Cercopithecus diama*). Marsha G. Williams and Tamara L. Bettinger, OSU.
- 2:15 Cast antler characteristics of a southeastern Oklahoma deer population. Edgar R. Welch, Jr., Stephen S. Ditchkoff, and Robert L. Lochmiller, OSU.
- 2:30 Effect of black-tailed prairie dog colonies on avifauna. Valerie A. Barko and James H. Shaw, OSU.
- 2:45 Nitrogen balance in the prairie vole (*Microtus ochrogaster*). Chad S. Boyd, Stephen S. Ditchkoff, Josh Raglin, Edgar R. Welch, Jr., and Robert L. Lochmiller, OSU.
- 3:00 Break
- 3:15 Development of a host resistance assay in wild cotton rats. Lee C. Jones and Robert L. Lochmiller, OSU.
- 3:30 Effects of acute cold stress on immune indices in protein deprived cotton rats. Elena I. Zhigulina and Robert L. Lochmiller, OSU.
- 3:45 Fluoride contamination in wild cotton rat populations inhabiting petrochemical waste sites in Oklahoma. Daniel P. Raftery, Robert L. Lochmiller, Karen McBee, and C. W. Qualls, OSU.
- 4:00 Seasonal changes in diet quality of cotton rats in relation to population density. Tim Schetter, Robert L. Lochmiller, Ronald E. Masters, and David M. Leslie, Jr., OSU.

SECTION H: MICROBIOLOGY  
MORNING SESSION  
SCIENCE HALL - SC 209  
MODERATOR: Leo T. Hall, PU.

- 9:00 Characterization of bacteriophage activities in a freshwater environment. Steven A. Ripp and Robert V. Miller, OSU.
- 9:15 \*Fungal cell wall degrading enzyme activity of vine-rot pathogens on cantaloupe tissue. Ki Kennedy, C. L. Biles and T. W. Cluck, ECU.
- 9:30 \*Interaction of potato glycoalkaloid with fungi: Effect on membrane potential. Misty McWilliams and James T. Blankmeyer, OSU.
- 9:45 Biological control of gray mold of geranium with antagonistic yeasts. Alexander B. Filonow, John Dole and Helen S. Vishniac, OSU.
- 10:00 BREAK
- 10:15 \*Comparison of single and double infections of MCMV and WSMV in corn, wheat and barley. Bryan D. Haggard and Kay Scheets, OSU.
- 10:30 Iron sulfide oxidation as a source of sulfate for sulfate reducing bacteria in the subsurface. Glen A. Ulrich, Joseph M. Sufita, Daryl Martino, Jim W. Ammerman, Ethan L. Grossman, Jannette L. Schlichenmeyer and Kate T. Clemence, OU.
- 10:45 Effects of solar ultraviolet radiation on recA in marine bacteria. Melissa G. Booth and Robert V. Miller, OSU.
- 11:00 Lux fusion of recA promoter. Mohamed Elasm and Robert V. Miller, OSU.
- 11:15 Section H Business Meeting. Election of officers.
- 11:30 All Academy Business Meeting - Science - Hall - Amphitheater.

Poster Presentations

- 1) Identification of an immunoreactive HSP70 homolog of *Pneumocystis carinii*. Sujatha Paul and Don C. Graves, OUHSC.
- 2) The responses of a murine host infected with *Pneumocystis carinii* to TGF  $\beta$  antibody. Aaron Smith, Saritha Chary-Reddy and Don C. Graves, OUHSC.
- 3) Effects of two varieties of *Cytophycoccus neoformans* on monocyte migration and surface L-selectin expression. Laura J. Theobald and Juneann W. Murphy, OUHSC.

\*Collegiate Academy (Undergraduate) Papers.

SECTION H: MICROBIOLOGY  
AFTERNOON SESSION  
SCIENCE HALL - SC 209  
MODERATOR: Gary Wolgamott, SWOSU

- 1:45 Random mutagenesis and suppressor analysis of photosystem II genes in cyanobacteria *Synechocystis* 6803. Sufan F. Al-Khaldi, Robert Burnap and Ming Qian. OSU.
- 2:00 The effects of mutant *Pseudomonas* exotoxin A molecules on splenocytes from athymic nude mice. Diane M. Dixon. SEOCU.
- 2:15 Receptor ligand interactions in the binding of natural killer cells to *Cryptococcus neoformans*. Allison L. Huebert and Juneann W. Murphy. OUHSC.
- 2:30 Chemokine production at the site of a delayed-type hypersensitivity reaction in mice immunized with cryptococcal culture filtrate (CneF). Hester A. Doyle and Juneann W. Murphy. OUHSC.
- 2:45 BREAK
- 3:00 Analysis of the Gα5 G protein and its role in the temporal regulation of tip morphogenesis in *Dictyostelium discoideum*. Kanchana Natarajan and Jeffrey A. Hadwiger. OSU.
- 3:15 Role of the Gα4 G protein in *Dictyostelium* development. Jaishree Srinivasan and Jeffrey Hadwiger. OSU.
- 3:30 Roles of the Propeptide from *Clostridium septicum* alpha toxin. Bret R. Sellman and Rodney K. Tweten. OUHSC.
- 3:45 Rheumatic heart disease: Investigation of the valvular lesions by immunohistochemistry. Suzanne Roberts, Terrence Dunn, Stanley Kosanke and Madeleine Cunningham. OUHSC.
- 4:00 Physiological and pathological aspects of circulating immune complexes. Melva L. Gonzalez and Frank Waxman. OUHSC.

SECTION I: ENGINEERING SCIENCES  
CARTER HALL ROOM 209

Neither the presenters or the Section Chair had submitted a program of papers for this section by the time the program had to go to the printer. In the event you had submitted a title to the section chair, your paper may still be presented. It will be slightly awkward but you should continue to work with your section chair (405) 436-8545 for an explanation and together produce a program even if it cannot be published.

- > Make multiple copies of this program.
- > Place some at the registration desk on November 3rd.
- > Post an enlarged copy on the door of the room assigned to your section.
- > Have copies available in the meeting room.



# SECTION J: BIOCHEMISTRY/BIOPHYSICS/MOLECULAR BIOLOGY

CARTER HALL, ROOM 105

MORNING SESSION: CHARLES G. SANNNY, OSU-COM, MODERATOR

- 9:45 a.m. COFFEE BREAK
- 10:00 a.m. Graphical analysis of similar data sets. Charles G. Sanny, OSU-COM.
- 10:15 a.m. Secondary structure prediction in alignment of viral movement proteins. Ulrich K. Melcher, OSU.
- 10:30 a.m. Function of manganese-stabilizing protein (MSP) and the interaction with the reaction center of photosystem II. Ming Qian, Coy Pierce, and Robert Burnap, OSU.
- 10:45 a.m. Sequence of *Pholuris demsylvanica* cDNA. Franklin R. Leach, Li Ye, and Holly J. Schaeffer, OSU.
- 11:00 a.m. Section J Business Meeting
- 11:20 a.m. OAS Annual Business Meeting, Science Amphitheater
- 12:00 noon - 1:30 p.m. OAS Banquet, Student Center Ball Room
- POSTER PRESENTATIONS, WEST RANGER ROOM
- Mechanism of TIMP-mediated inhibition of angiogenesis. April E. Nedcau, SNU.
- The effects of mechanical stress on  $\alpha$ -smooth muscle actin expression. Holley M. Matijou, SNU.

# SECTION K: MICROSCOPY

CARTER HALL, ROOM 205

MORNING SESSION: MODERATOR: DEAN PHILLIPS

- 9:00 Mechanisms of chalk compaction: an SEM/image analysis approach to understanding hydrocarbon production-induced subsidence in the North Sea. Benjamin N. Powell and Gary L. Lovell, Phillips Petroleum Company.
- 9:15 The versatility of x-ray photoelectron spectroscopy. Deborah A. Hess, Phillips Petroleum Company.
- 9:45 Developmental anatomy of *Polymyxa graminis* in roots of wheat. Larry J. Littlefield, John L. Sherwood, and Joanne H. Whalon, OSU.
- 10:00 Break
- 10:15 Toward *in vitro* fertilization in *Plumbago zeylanica*. Yajuan Cao and Scott D. Russell, OU. \*\*\*Timpano Competition\*\*\*
- 10:30 Surface charge of *Plumbago* sperm cells estimated from microelectrophoretic mobility. Zhaojie Zhang and Scott D. Russell, OU. \*\*\*Timpano Competition\*\*\*
- 10:45 The observation of calcium-induced precipitation in *Plumbago zeylanica* ovules. Hua Zhu and Scott D. Russell, OU. \*\*\*Timpano Competition\*\*\*
- 11:00 Section K: OMS Business Meeting
- 11:20 All Academy Business Meeting, SC Amphitheater
- 12:00 OAS Banquet, Student Center Ballroom
- 1:45 SECTION K: MICROSCOPY  
CARTER HALL, ROOM 205  
AFTERNOON SESSION: MODERATOR: PAIGE JOHNSON
- 2:30 Microwave processing techniques for microscopy. Steven Slap, Energy Beam Sciences, Inc., Agawam, Massachusetts. (Note: This is a joint presentation with Section N: Biomedical Sciences)
- 2:45 Ultrastructural features of a mature fourth instar larva of the Latin American bollfly, *Dermatobia hominis*. David A. Henderson and David T. John, OSU-COM.
- 3:00 Break
- 3:45 Tick-borne disease research in Africa. Katherine Kocan, OSU.
- 4:00 Conical wells for containing and transferring pollen for scanning electron microscopy. William F. Chissoe and John J. Skvarla, OU.
- Microscopy on the Internet: a tool for communication, education and research. Scott D. Russell, OU.

**SECTION L: MATHEMATICS, COMPUTER SCIENCE, AND STATISTICS**  
**CARTER HALL 108**

**MODERATOR: Scott Randby, SEOSU**

- 9:00 An integrated scheme for the distribution of adaptive finite element code in a heterogeneous computing environment, Donald J. Morton, Cameron University.
- 9:20 Introduction to the next three papers, G.E. Hedrick, OSU.
- 9:25 A review of a new spatial indexing technique, Michael Fan, OSU.
- 9:45 The time complexity of a new storage and retrieval method using the Fibonacci sequence, Allen DiVall and Yunpeng Zhang, OSU.
- 10:05 An experimental analysis of a new storage and retrieval method, Yunpeng Zhang and Allen DiVall.
- 10:25 Face-width minimal embeddings on surfaces, Scott Randby, SEOSU.
- 10:45 Section Business Meeting, Election of Officers.

**SECTION M: ENVIRONMENTAL SCIENCE AND PLANNING**  
**SCIENCE BUILDING ROOM 211**

**MODERATOR: CHARLES L. LEIDER, OKLAHOMA STATE UNIVERSITY**

- 9:00 Authoring multimedia software for education. Timothy J. Schmoll, OSU
- 9:15 101 Ranch: Endangered National Landmark - A case study in measured drawings. Charles L. Leider, OSU
- 9:30 A quick technique for drawing cultural landscapes in perspective. John R. Ritter, OSU
- 9:45 The hydrology of a created wetland. Steve Herr, ORU
- 10:15 Coffee Break
- 10:30 Memorial for Oklahoma bombing site: Heartland Memorial. Patty L. Evans, 4th year student in Landscape Architecture. OSU
- 10:45 Murrah Federal Building Site Memorial: Oklahoma City. Joy McDonald, 4th year student in Landscape Architecture, OSU
- 11:00 Environmental Science and Planning Business Meeting. Elect a section chair and vice chair.
- 11:20 - 11:50 OAS Annual Business Meeting, Science Building Amphitheater
- 12:00 noon OAS Banquet, Lecture and Awards - Student Union Ballroom



SECTION N: BIOMEDICAL SCIENCES  
SCIENCE BUILDING, ROOM 210

MORNING SESSION

MODERATOR: David T. John, OSU-COM

- 9:00 Comparative chemical analyses of lipopolysaccharides extracted from *Pseudomonas aeruginosa* strains with varying antibiotic sensitivities. Marsha J. Howard, Stacey L. Stewart and Robert S. Conrad, OSU-COM.
- 9:15 Using amphibians to model pain disorders. Stan Willenbring and Craig W. Stevens, OSU-COM.

- 9:30\* The presence and characterization of sex steroid receptors in non-reproductive tissues from female sheep. Jim B. Harjo, TJC (Mentors: Gary H. Watson and Jary S. Mayes, OSU-COM).

- 9:45\* Development of an indirect immunofluorescent assay for the identification of pathogenic free-living amebae. Deborah A. Archer, TJC (Mentor: David T. John; Supervisor: Marsha J. Howard, OSU-COM).

10:00 Break

MODERATOR: Charlotte L. Ownby, OSU-CVM

- 10:15 Persistent human coronavirus infection. Ottwin W. Schmidt, OSU-COM.

- 10:30 Cutaneous myiasis in a Tulsan who vacationed in Central America. David T. John and David A. Henderson, OSU-COM.

- 10:45 Effects of aloe vera and chlorhexidine on fibroblast repopulation of an *in vitro* wound. Brandon H. Joe, John J. Dmytryk, Barbara Safiejko-Mroccka and Paul B. Bell, Jr., OUHSC-College of Dentistry.

11:00 Section Business Meeting.

11:20 Academy Business Meeting, Science Building, Amphitheater.

12:00 OAS Banquet, Student Center Ballroom.

\*Collegiate Academy paper.

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SECTION N: BIOMEDICAL SCIENCES

AFTERNOON SESSION

JOINT SESSION WITH MICROSCOPY SECTION

CARTER HALL, ROOM 205

- 1:45 Microwave processing techniques for microscopy. Steven Slap, Energy Beam Sciences, Inc., Agawam, MA.

2:30 Break

SCIENCE BUILDING, ROOM 210

MODERATOR: STAN WILLENBRING, OSU-COM

- 2:45 Evaluation of breast cancer cell morphology using time-lapse videomicroscopy and scanning electron microscopy. J. Thomas Pento, Talitha T. Rajah and John J. Dmytryk, OUHSC-College of Pharmacy.

- 3:00 Analgesic potency of adrenergic agonists in amphibians. George M. Brenner and Craig W. Stevens, OSU-COM.

- 3:15 Langerhans cell depletion by staphylococcal superantigens is mediated by keratinocyte derived IL-1 $\alpha$  and TNF $\alpha$ . Stephanie Pickard, Gopi Shankar and Kim Burnham, OSU.

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**OPBS**  
 Oklahoma Partners for Biological Sciences  
*(Funded by the Howard Hughes Medical Institute)*

**MEETING**

When: 2:00-3:00 pm                      Where: Fine Arts 211

Instructors and students participating in the Fall 1995 OPBS Program will meet informally for:

- introductions
- exchange of ideas
- questions and answers
- discussion of research projects
- Please join us!

**OJAS Research Workshop**

for  
 Science Teachers, High School, and Junior High Students  
 November 3, 1994  
 Herod Hall Auditorium  
 Northwestern Oklahoma State University - Alva, Oklahoma

**Schedule**

- 7:30 - 11:00 a.m.                      Registration - Herod Hall Auditorium
- 8:15 - 8:45 a.m.                      Welcome Joe D. Ferguson, Director OJAS, Madill High School  
    Shaun Payne, Pres. OJAS, Lone Grove High School  
    Phillip Self, Vice Pres. OJAS, Kiowa Public Schools  
    Ella Burkhalter, Sec. OJAS, Lone Grove High School
- 8:45 - 9:00 a.m.                      Do Different Soil Types Retain Water Differently? (III), Ella M. Burkhalter, Lone Grove H.S.
- 9:15 - 9:30 a.m.                      To Catch A Fish's Eye (II), Luke Word, Lone Grove High School.
- 9:30 - 9:45 a.m.                      Soil vs. Water - Effects of Winter Wheat Growth, Jeremy Teel, Lone Grove Middle School
- 9:45 - 10:00 a.m.                      First Open Forum Question and Answer Session.
- 10:00 - 10:15 a.m.                      Break
- 10:15 - 10:30 a.m.                      A Study On Degradation of Keratin From Gallus domesticus Feathers (II), Phillip Self, Kiowa Public Schools.
- 10:30 - 10:45 a.m.                      Water Quality In Caddo Creek (II), Shaun Alan Payne, Lone Grove High School
- 10:45 - 11:00 a.m.                      Second Open Forum Question and Answer Session.
- 11:00 - 11:15 a.m.                      OJAS Business Meeting - Students, Coordinating Teachers, Director and Officers.
- 11:15 - 1:30 p.m.                      Lunch on your own. There is food service available at the Student Center on campus and fast food outlets just off campus.
- 1:45 - 5:00 p.m.                      Students and Teachers are encouraged to attend any of the OAS paper sessions. Please check your program for titles of interest.

Changes to the Program May be announced at the meeting.



## OAS ELECTS A NEW OCAS DIRECTOR

At its August 27th meeting at the University of Oklahoma, the Executive Council acted to fill the vacancy in the office of Director of the Oklahoma Collegiate Academy precipitated by the resignation of Leo Finkenbinder, Professor of Biology at Southern Nazarene University, who held this important OAS position since 1991.

The Council elected Dr. Nicholas J. Cheper, Professor of Biology, East Central University, director of OCAS. Dr. Cheper is an invertebrate biologist who received his BS in Biology from the University of Notre Dame and a PhD in Zoology from the University of Tennessee. He teaches zoology and ecology at ECU where he has served on the faculty since 1980.

Dr. Cheper brings to this office a long association with the Oklahoma Academy of Science. He served as a judge in both the local and state paper competitions of the Oklahoma Junior Academy of Science for the past 15 years. He was given a special citation for outstanding service to OJAS at its annual meeting in April of 1993.

The Oklahoma Collegiate Academy of Science was founded by OAS in 1966 to encourage scientific research by undergraduate college students by allowing them to present their research findings in the sectional programs of the senior Academy at its Fall Technical Meeting. In the beginning the collegiate papers were presented in a separate program. Now they are integrated within each of the 14 subject area sections.

Science students at Oklahoma colleges and universities will have an opportunity to present their papers this year at the OAS Annual Technical meeting November 3 at Northwestern Oklahoma State University at Alva. These papers will be judged by a panel appointed in each section. The collegiate papers are clearly marked in the official program booklet that lists all titles, authors and presentation time schedule. Plaques will be awarded to the best papers in each section and everyone who presents a paper will receive a certificate. It may be possible for student papers to be published in POAS or other scholarly journals at least in abstract form.

Dr. Cheper pledged to continue the excellent work of his predecessors in promoting original scientific research among undergraduates in Oklahoma. He feels that we should encourage college students to participate in scientific research, especially those who were active at the high school level and below through the activities of the Junior Academy. We must remember that our undergraduate researchers represent the future scientists of Oklahoma, The United States and the World.

Finally, Cheper requests the support of all the members of the OAS to promote the goals of the Collegiate Academy. He stated that he is only one person and with these papers being presented in 14 different rooms it will require the effort of all of us to evaluate them.

It is never to early to work for next year, Cheper added.

ENN

## OKLAHOMA ACADEMY OF SCIENCE PRESIDENTS

1910	H. L. Lane, OU	1952	V. B. Mornett, OAMC
1911	D. W. Ohem, OK City	1953	S. P. Massie, LU
1912	S. W. Reeves, OU	1954	A. N. Murray, TU
1913	C. W. Shannon, OU	1955	R. E. Olson, OU
1914	No meeting	1956	A. M. Stebler, OAMC
1915	C. W. Shannon, OU	1957	D. E. Howell, OAMC
1916	C. N. Gould, OU	1958	G. J. Goodman, OU
1917	L. C. Rairford, Iowa State	1959	Elmer Lucas, OU
1918	No meeting	1960	P. E. Smith, OUMS
1919	No meeting	1961	E. M. Hodnett, OSU
1920	M. M. Wickham, Norman	1962	H. B. Barclay, TU
1921	A. F. Reiter, PU	1963	G. A. Moore, OSU
1922	J. B. Thornburn, OK City	1964	A. D. Buck, NOIC
1923	R. O. Whittenon, OAMC	1965	J. E. Webster, OSU
1924	S. Weidman, OU	1966	C. R. Williams, PU
1925	(Spring) C. E. Sanborn	1967	C. D. Riggs, OU
1926	(Fall) H. L. Dodge, OU	1968	E. A. Reynolds, SWSC
1927	J. H. Gould, OAMC	1969	L. V. Scott, OUHSC
1928	C. N. Gould, OU	1970	C. C. Carpenter, OU
1929	O. M. Smith, OAMC	1971	Paul Buck, TU
1930	A. Richards, OU	1972	W. A. Carter, ECSU
1931	Leroy Long, OK City	1973	C. J. Mankin, OU
1932	A. O. Weese, OU	1974	N. N. Durham, OSU
1933	Herbert Patterson, OAMC	1975	Barbara Shirley, TU
1934	J. E. Knowles, PU	1976	G. W. Todd, OSU
1935	F. G. Brooks, OCU	1977	D. E. Kitzer, Noble Foundation
1936	C. E. Decker, OU	1978	George Odell, OSU
1937	H. J. Harper, OAMC	1979	Richard Couch, ORU
1938	B. D. Barclay, TU	1980	Gary Wolganott, SWSU
1939	C. M. Perry, OU	1981	Elroy Race, OU
1940	H. D. Chase, TU	1982	Everett Grigsby, NSU
1941	G. L. Cross, OU	1983	Jack Sokatch, OUHSC
1942	R. W. Jones, OAMC	1984	Mary Whitmore, OU
1943	H. I. Featherly, OAMC	1985	Jeff Black, OBU
1944	O. F. Evans, OU	1986	Jerry Wilham, OSU
1945	V. G. Heller, OAMC	1987	Manford K. Patterson, Noble Foundation
1946	J. R. Nielsen, OU	1988	Mary P. Carpenter, OU
1947	O. C. Derner, OAMC	1989-1990	Kenneth E. Conway, OSU
1948	J. T. Self, OU	1991-1992	James K. McPherson, OSU
1949	L. S. McLeod, TU	1993-1994	James R. Estes, OU
1950	J. C. Shirley, PU	1995-1996	Jack D. Tyler, Cameron
1951	Howard Taylor, OCW	1997-1998	Connie Taylor, SEOSU
	H. W. Larsh, OU		



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