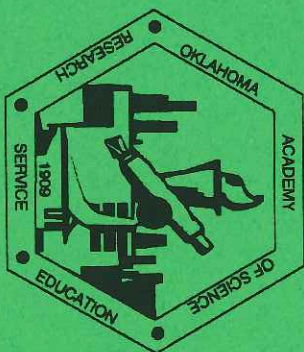


OFFICIAL PROGRAM
OF THE
87TH ANNUAL TECHNICAL MEETING

OKLAHOMA ACADEMY OF SCIENCE

Affiliated with the
American Association for the Advancement of Science
National Association of Academies of Science
American Junior Academy of Science



SATURDAY
November 14, 1998

NORTHEASTERN STATE UNIVERSITY
TAHLEQUAH, OK

FORWARDING SERVICE REQUESTED

OKLAHOMA ACADEMY OF SCIENCE
Office of the Executive Secretary-Treasurer
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OKLAHOMA ACADEMY OF SCIENCE

Since 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.

OKLAHOMA ACADEMY OF SCIENCE EIGHTY-SEVENTH ANNUAL TECHNICAL MEETING NORTHEASTERN STATE UNIVERSITY

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THE OKLAHOMA ACADEMY OF SCIENCE

87TH ANNUAL FALL TECHNICAL MEETING

Northeastern State University

Program Summary

Friday, 13 November 1998

6:30 p.m. Executive Council Dinner and Meeting U. Center Lobby

Saturday, 14 November 1998

7:30 a.m. - 11:30 noon Registration for Technical Meeting U. Center Lobby

7:30 a.m. - 11:00 a.m. Registration Junior Academy Workshop Practical Arts 307

8:00 a.m. - 11:00 a.m. Concurrent Scientific Paper Sessions Listed Below

Section A Botany	PA 101	Section A Zoology	PA 102
Section B Geology	PA 119	Section C Physical Sciences	PA 118
Section D Social Science	PA 217	Section E Science Education	PA 202
Section F Geography	PA 218	All Sections Posters	Ballroom Lobby
Section G Fish and Wildlife	PA 220	Section H Microbiology	PA 308
Section I Engineering Sci	PA 306	Section J Biochem/Biophysics	PA 125
Section K Microscopy	PA 201	Section L Math/Computer Sci	PA 219
Section M Environmental	PA 304	Section N Biomedical Sci	PA 305
Section Z Junior Academy	Workshop on Student Research		PA 307

Key to Building Abbreviations: PA= Practical Arts Building UC= University Center

11:00 a.m. - 11:15 a.m. Section Meetings in assigned meeting rooms listed above. Please participate in the election of the 1999 Section Vice Chair.

11:20 a.m. - 11:50a.m. All Academy Business Meeting Practical Arts 307
OAS members are encouraged to attend and visitors are welcome.

12 noon - 1:30 p.m. OAS AWARDS BANQUET UC Ballroom

Admission by ticket only. Tickets in registration packet and at desk.

Dr. James M. "Milt" Hefflin, Jr. NASA Space Flight Director
"Human Space Flight- Where in the Heavens Are We Going?"

1:45 p.m. - 5:00 p.m. Continuation of Concurrent Scientific Paper Sessions

2:00 p.m. - 3:00 p.m. Special Section Oklahoma Partners for Biological Sciences PA 121

An OAS name badge, obtained by registering, is required for all individuals attending Academy workshops and meetings.

All presenters must register and wear an official name badge.

GENERAL INFORMATION

Parking: Members and visitors may park in any of the parking areas indicated on the map on the back cover of this booklet. Parking is free to all NSU visitors on that day.

Preregistration assists greatly in the planning by the host institution to accommodate a large influx of visitors.

Fee Schedule:

Members - \$10 Student Members - \$5
Nonmembers - \$15 Student Nonmembers - \$7.50

Banquet - \$10

The preregistration period will continue until November 7, 1998. If you have not already done so please utilize the registration form provided in this booklet and register before November 7. You will save time and money by preregistration. The cost will increase on November 8-14. Banquet tickets may not even be available. They usually are but they will cost more on Nov. 14.

On Site Registration creates a chaotic condition of congestion at the registration area. In order to reduce this situation, on site prices have been increased as a disincentive to on site registration.

On site Fee Schedule:

Members - \$15, Student Members - \$10, Nonmembers - \$20
Student Nonmembers - \$10, Banquet - \$15 (if available)

1998 and/or 1999 Dues are Payable Now.

The OAS registration desk will accept annual dues payments that are accompanied by an appropriate application or renewal form. Payment of registration, banquet and dues may be combined in a single check. If you need a hand written receipt request one from the several student clerks serving you.

Academy Business Meeting: The 87th Annual Business Meeting of the Oklahoma Academy of Science will be held in Practical Arts 307 11:20 a.m. All OAS members are encouraged to attend and registered visitors are welcome.

All Academy Award Banquet

This gala affair will be held in the Ballroom of the Student Union. Tickets are required for the meal, awards ceremony and featured speaker. Students and others may be admitted after the meal in order to hear the featured speaker as space allows.

Papers may be published in the Proceedings of the Oklahoma Academy of Science, subject to the editorial policies as published in v. 76, pp. 117-125. Manuscripts, an original and two copies are required, or alternatively manuscripts may be submitted on computer disk or attached to an e-mail document. Mail manuscripts or diskettes to Dr. Thomas L. Warren, Editor, POAS, Department of English, 205 Morrill Hall, Oklahoma State University, Stillwater, OK 74078-0135. E-mail: twarren-osu@osu.net Manuscripts received after May 15, 1999 will be accepted for publication in November 1999.

OAS members are charged \$30 per page and nonmembers are charged \$100 per page

Inquiries relating to OAS policies, activities and membership may be directed to the Executive Secretary-Treasurer, P.O. Box 701915, Tulsa, OK 74170-1915, Fax 918 743-2428, Home Office 918 742-5709 or E-mail enelson@orn.edu.

OAS Home Page: <http://dnb-fs1.biochem.okstate.edu/OAS/OASHomePage.html>

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.

No Smoking is permitted in any classroom on the campus. Also food and drink are not permitted in any meeting room.

Model Accommodations: The designated headquarters motel for the 87th Annual Technical Meeting will be the Holiday Inn Express, HWY 62 Bypass @ 4th Street, Tahlequah, OK. (918) 456-7800. Rate quoted: Single \$40 plus tax, double \$40 plus tax, continental breakfast included. Telephone for reservations and rate confirmation. Inform the desk you are an OAS delegate. The rate quoted is the so called state rate for those delegates whose employers will reimburse. Other discounts may apply. Ask before you register.

Other motels in the vicinity of NSU listed in order of preference by Tahlequah residents.

Name	Address	Phone	Single	Double
Oak Hill Motel and Suites	2600 S. Muskogee Ave.	918-458-1200	\$35.84	Call
Budget Host/ Tahlequah Motor Lodge	2501 S. Muskogee Ave.	918-456-2350 1-800-480-8705	\$45.00	\$49.00
Phoenix Inn	1101 E. Downing St.	918-456-2538	\$30.00	Call
Oak Park Motel	706 E. Downing St.	918-456-2571	\$29.00	Call
Economy Inn	1800 S. Muskogee Ave.	918-456-6124	\$32.00	Call
River City Motel	1401 E. Downing St.	918-456-2571	\$29.60	Call
Cherokee Inn	501 E. Downing St.	918-456-3621	\$38.20	Call

Free Student Housing: There will be a limited number of bunkhouse spaces for students available the evening of November 13. These will enable student attendees to avoid the long day of commuting on the 14th. These accommodations are located on the Illinois River. If you have the time to drive up to Tahlequah on Friday you may want to take advantage of this opportunity. Call Dr. Craig Clifford before

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you drive up at 918 456 5511 Ext. 3827 for additional information and to reserve a space. Name badges prepared prior to your arrival if you preregistered, or prepared on site if you did not preregister must be displayed at all times while attending Academy sectional programs, business meetings, refreshment centers and banquet. If you do not display OAS identification you may be asked to leave by the persons in charge of these areas. Lost badges may be replaced at the registration desk upon the verification of your status.

Official Program Booklet: Bring this copy that was mailed to you to the meeting. A replacement copy may be purchased for \$2.00 at the registration desk.

FUTURE MEETINGS

1999 Spring Field Meeting has just been scheduled. Dr. Larry Magrath, Department of Biology, University of Science and Arts of Oklahoma, Chickasha, OK 73018-5358. 405 224-3140 Ext. 292. E-mail: jcmagrath@mercur.usao.edu is planning the details for this meeting. We have selected the dates of April 23-25, at Robbers Cave State Park, Wilburton, OK. Convey your suggestions for tailoring this meeting to meet your needs to him. If you need more details before the March 1999 OAS Newsletter, he is the person to contact.

1999 Fall Field Meeting is still in the planning stages. The Section Chair of Section G: Fish and Wildlife, Keith Martin, will select a site after the first of the year and will recruit the field trip leaders shortly thereafter. He has suggested Boiling Springs State Park or Black Mesa State Park as possible sites. He wants the members to contact him by e-mail: lmartin@loner.net with site preferences and program suggestions. Alternatively you may contact him by telephone at 918 343-7706 or by mail at Division of Math-Science, Rogers State College, Claremore, OK 74017-2099

The 1999 Annual Technical Meeting place and time is now scheduled. Oklahoma City University will host us on Saturday November 13, 1999. This will be a second year in a row that an annual meeting will be held on a Saturday. Dr. Susan Barber, Chair, Biology Department OCU, will be the on site faculty coordinator. Members may contact her by mail at 2501 N. Blackwelder, Oklahoma City, OK 73106, Telephone: 405 521-5256, or by e-mail at sbarber@frodok.okcu.edu.

The 2000 Annual Technical Meeting has been invited to the campus of Oral Roberts University, Tulsa OK, Friday November 10, 2000.

The 2001 Annual Technical Meeting

Does anyone want to host the first OAS Annual Technical Meeting of the new millennium? If your institution is interested notify OAS President Elcet David Bass, Department of Biology, University of Central Oklahoma, Edmond, OK 73034-0017, Telephone 405 341-2980 Ext. 5772, E-mail: dbass@ix1.ucook.edu

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SECTION A: BIOLOGICAL SCIENCES (Botany Subsection)

Practical Arts Building Rm. 101

MODERATOR: RAHMONA THOMPSON, ECU

Morning Session:

- 9:00 Little Bluestem (*Schizachyrium scoparium*) at the Great Salt Plains: or ecotype phenotype? ***Jennifer E. Johnston** (University of Oklahoma)
- 9:15 The vegetation of Oklahoma: a new classification. **Bruce Hoagland** (University of Oklahoma and OKla. Natural Heritage Inventory)
- 9:30 Factors affecting plant distribution in a semiarid grassland. Holly Beck and **Anne F. Cross** (Oklahoma State University)
- 9:45 Ecology of *Ichtiocaea pauida*. **Sonia Jaiswal** (Oklahoma State University)
- 10:00 The effects of *Pfiesteria piscicida*. ***Stormy D. Beasley** (Univ. of Science and Arts of Oklahoma)
- 10:15 Plankton and eutrophication in Lake Evelyn (Tulsa, OK). ***Joe A. Szymanski** (Oral Roberts University)
- 10:30 Break
- 10:45 Succession of wetland plants in the Creek Nation Mitigation Site. ***Cara C. Powers** (Oral Roberts University)
- 11:00 Section A Business Meeting (Rm. 102)
- 11:20 All Academy Business Meeting (Rm. 307)
- 12:00 All Academy Awards Banquet University Center Ballroom

Afternoon Session:

- 1:30 Possible defense related enzymes of cantaloupe fruit: chitinase activity. **Charles L. Biles** (East Central University)
- 1:45 Mutant analysis of endosperm development in *Arabidopsis*. **Jiagian Wu** and **David Meinke** (Oklahoma State University)
- 2:00 Relatively inexpensive electronic and photographic methods for aerial surveys of Oklahoma seep bogs. **John R. Wright**, John Taylor and Connie Taylor (Southeastern Oklahoma State University)
- 2:15 Extremophiles from the Great Salt Plains National Wildlife Reserve. **Janice L. Hironaka** (Oklahoma State University)
- 2:30 My 65 year study of southeast Oklahoma pine forests. **Elbert L. Little** (USDA-FS)
- 2:45 Checklist of ferns of Natural Falls State Park. **Bruce A. Smith** (Oklahoma State University)
- 3:00 Identification of a neurotoxic compound in *Asclepias subverticillata*. **Gregg H. Robinson**, George E. Burrows, Elizabeth M. Holt, Ronald J. Tyrl and A. Daniel Jones (Oklahoma State University)
- Presenter in bold, * undergraduate presenter**

SECTION A: BIOLOGICAL SCIENCES (Zoology Subsection)
 Practical Arts Building Rm. 101
 MODERATOR: MICHAEL BAY, ECU

- 8:15 The courtship and mating behavior of the Egyptian Diadem Snake
 (*Spelerosophis diademi cliffordii*). **Robert Ball** (Panola College)
- 8:30 Insect pollination of the spider milkweed, *Asclepias viridis* Walt.
 (Asclepiadaceae). **Shang-wen Liaw** (University of Central Oklahoma)
- 8:45 A preliminary survey of hantavirus and arenavirus in Oklahoma rodents.
Richard A. Nisbett (OUHSC), William Caire (University of Central
 Oklahoma) and Michael Stuart (University of North Carolina)
- 9:00 Proposed research for the study of thermal ecology of *Thryonomys*
cornutum. **Tiffany A. Russell** (Oklahoma State University)
- 9:15 Long term changes (1976-1998) in the fishery habitat of the Red River in
 southwest Oklahoma. **Jimmie Pigg** (Okla. Dept. Envir. Quality)
- 9:30 **Break**
- 9:45 New chemical attractants for the yellowjackets of Oklahoma. ***Charity A.**
Dickey (Oral Roberts University)
- 10:00 Two late pleistocene fossils from the Washita local fauna.
 ***Shane W. Norris** (Southwestern Oklahoma State University)
- 10:15 Mesocarnivores, crossstimbers, and landscape manipulations.
Laurence P. Levesque, Eric C. Helligren, David M. Engle
 and David M. Leslie (Oklahoma State University)
- 10:30 Seasonal distribution of the hypotheos in five Oklahoma streams.
Gary W. Hunt (Oklahoma State University)
- 11:00 **Section A Business Meeting (Rm. 102)**
- 11:20 **All Academy Business Meeting (Rm. 307)**
- 12:00 **All Academy Awards Banquet University Center Ballroom**

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SECTION B: GEOLOGY
 PRACTICAL ARTS BUILDING, ROOM 119

Moderator: **LeRoy A. Hemish**, Oklahoma Geological Survey

Morning Session:

- 9:00 Permian geology of the northern Oklahoma City Metropolitan Area.
LeRoy A. Hemish, (OGS)
- 9:15 Are porosity and permeability facies selective? — An example from the Pennsylvanian
 Cottage Grove Sandstone (Osage-Layton), Cherokee Platform, north-central Oklahoma.
James R. Chaplin (OGS).
- 9:30 Distinction of depositional system in carbonate sequence by application of organic
 geochemistry—An example of the Upper Jurassic Smackover Formation. **Kulwadee L.**
Piggott, (OU).
- 9:45 Characterization of high molecular weight hydrocarbons (>C₄₀) in crude oils from various
 depositional environments worldwide. **Michael Hsieh**, (OU).
- 10:00 **BREAK/POSTER SESSION**
- 10:30 Applications of finite element analyses to problems in structural geology. **Kevin J.**
Smart, (OU).
- 10:45 Paired granites: Further evidence from the Wichita Mountains, Oklahoma. **Jonathan D.**
Price, (OU).
- 11:00 **SECTION B GEOLOGY BUSINESS MEETING**
- 11:20 **ALL ACADEMY BUSINESS MEETING**
- 12:00 **OKLAHOMA ACADEMY OF SCIENCES BANQUET**
- POSTER: Early Paleozoic in boreholes in northeastern Oklahoma. **D. Fay Simms**, **John J.**
Simms, and **Mark French**, Northeastern Oklahoma University.

* Afternoon Sessions Begins at 1:45*

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SECTION B: GEOLOGY
PRACTICAL ARTS BUILDING, ROOM 119

Moderator: LeRoy A. Hemish, Oklahoma Geological Survey

Afternoon Session:

- 1:45 Descriptions of South African kimberlite-hosted eclogites and alkrenites. **Joseph D. Dischinger, (OU).**
- 2:00 Titanite-Fluorite stability: Fluorine content of the Mount Scott granite magma. **Jonathan D. Price, John P. Hogan, M. Charles Gilbert, David London, and George B. Morgan IV. (OU).**
- 2:15 Fluid inclusion evidence for rapid cooling during crystallization of granitic pegmatites. **Joseph M. Evensen and David London. (OU).**
- 2:30 Crediting optional activities in Earth Science courses using an "Insurance" metaphor. **Vernon P. Scott, (OSU).**

END OF SESSION

SECTION C: PHYSICAL SCIENCE
PRACTICAL ARTS BUILDING RM 118
MODERATOR: D. L. MYERS, EAST CENTRAL UNIVERSITY

Morning Session:

- 9:00 Bonner Sphere Neutron Spectroscopy. **Evan Lemley, Department of Physics, UCO**
- 9:20 Building Virtual Instruments with LabVIEW. **Kervin M. Colbert, UCO, OSU**
- 9:40 Bohr-Sommerfeld Quantization of Bound State Motion in the Schwarzschild Metric. **Weldon J. Wilson, Department of Physics, UCO**
- 10:00 MathML, Amaya, and Perpetual Motion. **James S. Meyer, St. Gregory's University**
- 10:20 Dynamics of Hydrogen Fluoride in an Electric Field. **Yan Yee (Fion) Sin and David L. Martin, UCO**
- 10:40 Infrared Spectra of Manganese Doped Yttrium Barium Copper Oxide Superconductor. **Dwight L. Myers and John Lilly, ECU**
- 11:00 Section C Business Meeting - your attendance at this meeting is crucial.
- 11:20 All Academy Business Meeting. **PA 307**
- 12:00 All Academy Awards Banquet. **University Center ballroom**

SECTION D: SOCIAL SCIENCES
 Practical Arts Building, Room 217
 Morning Session: Moderator: **Lois E. Albert**

- 9:30 A Survey of the Washita River and Plains Village Settlement in Central Oklahoma,
Richard Drass (OU)
- 9:45 1998 Excavations at the Kubik Site, 34KA354, Kay County, Oklahoma,
William L. Neal (OU)
- 10:00 Break
- 10:15 A Survey of Cherokee Sites in Northeastern Oklahoma,
Lois E. Albert (OU)
- 10:30 Social Welfare Policy: a Good "Market" for Business,
Thomas D. Watts (UT - Arlington)
- 10:45 Yesterday's Trash, Today's Archeology: The Assessment of Twentieth Century
 Archeological Remains and a Growing Problem in Cultural Resources. **John Hartley.**
- 11:00 Section D Business Meeting. Election of Officers.
- 11:20 All Academy Business Meeting, Practical Arts Rm. 307
- 12:00 Banquet. Speaker: James M. "Mit" Hefflin, Jr., NASA Space Flight Director. "Human
 Space Flight - Where in the Heavens are We Going?"

SECTION E: SCIENCE EDUCATION
 PRACTICAL ARTS BUILDING RM 202
 MODERATOR: **DANITA HUNDLEY, WESTERN HEIGHTS HIGH SCHOOL**

- 8:45 Human anatomy learning transfer from computer to cadaver. **P. Alan Lennon**
 and **G. Matthew Newell, SEOSU**
- 9:00 Taking students inside today's instruments. **Gordon L. Eggleton**
 and **Larry Watts, SEOSU**
- 9:30 Break
- 11:00 Section E Business Meeting. Election of Officers. Future section planning.
- 11:20 All Academy Business Meeting. Rm. P. A. 307

SECTION F: GEOGRAPHY
 PRACTICAL ARTS BUILDING RM 218
 MODERATOR: **REBECCA SCOTT, UNIVERSITY OF OKLAHOMA**

- 9:00 Windows On The World: A GIS Education Project Tailored to the Needs of
 Individual Teachers. **Julie A. Parker, University of Oklahoma**
- 9:30 Improving the School to Career Transition for Geography Students.
Melody Tipton, Tom Wikle, and Alyson Greiner, Oklahoma State University
- 10:00 Threats to Our National Wildlife Refuges. **Ed Pugh, University of Central
 Oklahoma**
- 10:30 Returning to the Land: Defining Human Carrying Capacity and Understanding
 Natural Resources. **J. C. Alexander, University of Central Oklahoma**
- 11:00 Section F Business Meeting to discuss our future plans with OAS.
 Chair: **Rebecca Scott,**
 Project Director of the Oklahoma Alliance for Geographic Education
 Co-vice chairs: **Ed Pugh and J. C. Alexander, University of Central Oklahoma**
- 11:20 All Academy Business Meeting PA 307
- 12:00 All Academy Awards Banquet University Center Ballroom

SECTION G: FISH AND WILDLIFE CONSERVATION
PRACTICAL ARTS BUILDING RM 220
MODERATOR: DOYLE L. CROSSWHITE, ST. GREGORY'S UNIVERSITY

MORNING SESSION

- 8:45 Impacts of Saugeye Introductions on Growth and Population Structure of Largemouth Bass and White Crappie. **Wyatt J. Doyle** and **Dale Toetz**, Oklahoma State University
- 9:00 Can Waste Waters from a Chicken Processing Plant Alter the Fish Community of a Small Stream in NE Oklahoma? **Jimmie Pieg**, Oklahoma Department of Environmental Quality
- 9:15 Use of Fluorescent Powder as a Method to Quantify Microhabitat Use and Movement of Texas Horned Lizards (*Phrynosoma cornutum*). **Richard C. Stark** and **Stanley F. Fox**, Oklahoma State Univ.
- 9:30 Land Use Practices and the Texas Horned Lizard in the Western Rio Grande Plains, Texas: Preliminary Results. **Richard T. Kazmaier**, **Anna Burrow**, and **Donald C. Ruthven, III**, Oklahoma State University
- 9:45 Restoration and the Cicadiform Species of Ralston Island, Salt Plains National Wildlife Refuge. **Shane T. Feirer** and **David M. Leslie, Jr.**, Oklahoma State University and Okla. Coop. Fish and Wildl. Research Unit.
- 10:00 Break
- 10:15 The Status of Plethodontid Salamanders at Horsethief Spring, LeFlore County, Oklahoma. **Doyle L. Crosswhite**, **Lance R. Williams**, and **Marsha G. Williams**, St. Gregory's Univ. and Mississippi State Univ.
- 10:30 Distribution and Status of Alligator Snapping Turtles in Eastern Oklahoma With Notes on Aquatic Turtle Communities. **J. Daren Riedle**, **Paul A. Shipman**, and **Stanley F. Fox**, Oklahoma State University.
- 10:45 Status of the Arkansas Darter (*Etheostoma cragini*) and Least Darter (*E. micropetca*) in Arkansas. **Chad W. Hargrave**, University of Oklahoma.
- 11:00 **Section G Business Meeting**
- 11:20 **All Academy Annual Business Meeting** PA 307
- 2:00 **All Academy Awards Banquet** University Center Ballroom

SECTION G: FISH AND WILDLIFE CONSERVATION
PRACTICAL ARTS BUILDING RM 220
MODERATOR: DOYLE L. CROSSWHITE, ST. GREGORY'S UNIVERSITY

AFTERNOON SESSION

- 1:30 Nesting Success of Snowy Plovers and Least Terns at Salt Plains National Refuge. **Joanna B. Whittier** and **David M. Leslie, Jr.**, Oklahoma State University and Okla. Coop. Fish and Wildl. Research Unit.
- 1:45 Can Prairie Dogs Beat City Hall? **Jack D. Tyler**, Cameron University
- 2:00 Succession of Fish in a Newly Created Pond. **William J. Lints**, Oral Roberts University
- 2:15 Community Ecology of Prairie Dog Towns in Helena Valley, Montana **Stacie L. Wooley**, Oral Roberts University
- 2:30 *100th Meridian Initiative to Prevent the Westward Spread of Zebra Mussel. **Scott C. Haywood**, Northeastern State University
- Poster: Diet of the Collared Lizard (*Crotaphytus collaris*) in west-central Texas. **Jerry F. Husak** and **J. Kelly McCoy**, Angelo State University.
- * Collegiate paper

SECTION H: MICROBIOLOGY
PRACTICAL ARTS BUILDING RM 308
MODERATOR: RIAZ AHMAD, UCO

MORNING SESSION I

- 8:45 *Site-directed mutagenesis of an enigmatic c-type cytochrome of cyanobacterial photo system II. **Luan D. Dao**. OSU.
- 9:00 From sequence to function; a large scale study of deleted genes linked to plant salt stress response in the Model system *synechocystis* PCC56803. **Bradley L. Postier** and Robert C. Bernap. OSU.
- 9:15 Screening intestinal microorganisms for the presence of cytochrome P450 by use of spectral analysis and protein profiles. **Shannon D. Walls** and Gilbert H. John. OSU.
- 9:30 Screening for the presence of cytochrome P450 in Human intestinal bacteria by PCR and southern blot. **K.J. Abraham** and Gilbert John. OSU.
- 9:45 Effects of solar UV radiation on marine microorganisms. **Robert V. Miller** and Melissa Booth. OSU.
- 10:00 **BREAK/POSTER SESSION**
 Long distance cis effects on sgRNA synthesis in maize chlorotic mottle virus. **Kay Scheets**. OSU.
- 10:15 An operon conferring UV light resistance in the streptococcal conjugative transposon Tn5252. **Ursula M. Munoz-Najar** and Moses N. Vijayakumar. OSU.
- 10:30 Characterization of a DNA cytosine methyltransferase gene in the conjugative transposon Tn5252. **Janardhan Sampath** and Moses N. Vijayakumar. OSU.
- 10:45 *Does the Cyanobacterium *synechocystis* sp. PCC 6803 have a plant chloroplast-like inostitol stress signaling system. **Ryan M. Krtin**. OSU.
- 11:00 Isolation and characterization of a cytoplasmic protein induced in the presence of surfactants. **Ronald Keith** and Gilbert John. OSU.
- 11:15 Section H Business Meeting (PA 308). Election of officers.
- 11:20 All Academy Business Meeting (PA 307).
- 12:00 OAS Awards Banquet
 *Collegiate Academy (Undergraduate) Papers

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SECTION H: MICROBIOLOGY
PRACTICAL ARTS BUILDING RM 121
MODERATOR: CHARLES BILES, ECU

MORNING SESSION II

- 8:45 Development and characterization of a biosensor for DNA-damaging agents in the environment. **Mohamed Elasri** and Robert Miller. OSU.
- 9:00 *The effects of temperature on the hatching of eggs of *Trichobitharzia stagnicolae* (a schistosome). **Rebecca J. Byker**. ORU.
- 9:15 *Rapid screening procedure for genotyping transgenes and gene mutations in mice. **David M. Carlson**. ORU.
- 9:30 *Effect of PPAR activators on TNF expression in mice during endotoxemia. **Karen Reynolds**. OCU.
- 9:45 *Isolation of subsurface ethanol degrading microorganisms. **Stefanie K. Winningham**. EOSC.
- 10:00 **BREAK/POSTER SESSION**
 *Comparison of IgG subtypes in primates. **Robyn D. Dark**. ECU.
- 10:10 *Aeration and length of exposure to light affect development of *Fusarium solani* and formation of proteins. **Carmen M. Juarez**. ECU.
- 10:20 *Enzyme activity, protein and dsRNA profiles of yellow and non-pigmented *Monosporascus cannonballus*. **David A. Juarez**. ECU.
- 10:30 *Antibiotics: How toxic are they? **Loretta G. Rush**. ECU.
- 10:40 *Influence of methyl-tert butyl ether and trichloroethylene on seed germination and dehydrogenase activity in soil. **Michelle L. Trumble**. ECU.
- 10:50 *Linking bismuth isotopes to biotin by means of milk casein micelles. **Jeremy Huddleston**. SEOSU.
- 11:00 Section H Business Meeting (PA 308). Election of Officers.
- 11:20 All Academy Business Meeting (PA 307).
- 12:00 OAS Awards Banquet
 *Collegiate Academy (Undergraduate) Papers

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SECTION H: MICROBIOLOGY
PRACTICAL ARTS BUILDING RM 308
MODERATOR: ALEXANDER C.K. LAI, OSU

AFTERNOON SESSION:

- 1:45 Characterization of viral epitopes from HIV-infected cells.
Heather D. Hickman, Kiley R. Prillman and William H. Hildebrand. OUHSC.
- 2:00 Cancer vaccination strategies against viral induced tumors.
Allison M. Watts and Ronald C. Kennedy. OUHSC.
- 2:15 The humoral immune response to an *In Utero* Hepatitis B surface antigen immunization in a baboon model. **P. Scott Hefly**, John R. Stanley and Ronald C. Kennedy. OUHSC.
- 2:30 High throughput HLA typing of bone-marrow donor-recipient pairs by direct automated sequencing. **David Sidebottom**. OUHSC.
- 2:45 Microbial growth inhibition from plant extracts. **James T. Blankemeyer** and Mendel Friedman. OSU.
- 3:00 **BREAK/POSTER SESSION**
- 3:15 *Evolution of equine influenza virus: Analysis of the HA gene of A/Eq/Kentucky/98. **Lori A. Impson**. OSU.
- 3:30 Avian influenza viruses as potential source for human influenza pandemic. **Sandra McCoy** and Alexander C.K. Lai. OSU.
- 3:45 Cytokines induction by influenza viruses: a possible correlation to pathogenicity. **Senad Divanovic** and Alexander C.K. Lai. OSU.
- 4:00 *Co-expressing HBV genome and human interferon alpha as a new DNA vaccine. **James B. Harris**. OSU.
- 4:15 A novel DNA vaccine for Equine influenza virus using genetic adjuvants to target mucosal immunity. **Brian C. Decocq** and Alexander C.K. Lai. OSU.

*Collegiate Academy (Undergraduate) Papers

SECTION I: ENGINEERING SCIENCES
PRACTICAL ARTS BUILDING RM 306
MODERATOR: SARAH L. KIMBALL, OSU

MORNING SESSION:

- 9:00 Non-linear Dynamic Response Analysis of Steel Frames with Semi-Rigid Joints.
Ali S. Abolmaali and Anant R. Kukreti, OU.
- 9:20 Development of Very Early Strength Patching Materials for Rigid Pavements.
Christopher C.E. Ramseyer, Bruce W. Russell and Thomas D. Bush, OU.
- 9:40 *Cyclic Performance of Double Web Angle Connections.
Carmen M. Diaz, Matthew I. Ranck and Anant R. Kukreti, OU.
- 10:00 * Four-Bolt End-Plate Beam to Column Connections.
Laura C. Dionisio and Anant R. Kukreti, OU.
- * Undergraduate Collegiate Academy Competition
- 11:00 Section I. Business Meeting
- 11:20 All Academy Business Meeting. 307 Practical Arts Building
- 12:00 OAS Award Banquet University Center Ballroom A

SECTION J: BIOCHEMISTRY/BIOPHYSICS/MOLECULAR BIOLOGY
PRACTICAL ARTS BUILDING RM 125
MODERATOR: STEVEN WHITE, OSU

MORNING SESSION:

- 9:40 Purification, Characterization, and Sequence Homologies of Tarantula Venom Peptides. **David L. Brigham**, Steven White, and George Odell, Department of Biochemistry and Molecular Biology, OSU
- 10:00 A Virus Signature Amplification (VISA) Method using PCR for the Simultaneous Assay of Viruses Causing Bovine Respiratory Disease. **Kenji Onodera**, Jean d'Offay, and Ulrich Melcher, Department of Biochemistry and Molecular Biology, OSU
- 10:20 *NADH Channeling Occurs Without Association of Enzymes at Equilibrium. **Franklin A. Hays** and H. Olin Spivey, Department of Biochemistry and Molecular Biology, OSU
- 10:40 Ocular Proteomics: Cataloging Photoreceptor Proteins by Two-dimensional Gel Electrophoresis and Mass Spectrometry. **Hiroyuki Matsumoto** and Naoka Komori, Department of Biochemistry and Molecular Biology, UOHSC
- 11:00 Section J Business Meeting
- 11:20 All Academy Business Meeting, PA 307
- 12:00 All Academy Awards Banquet, University Center Ballroom

AFTERNOON SESSION
MODERATOR: ROBERT STEINBERG, UOHSC

- 1:45 Competition in Tobamovirus Replication in Tobacco Protoplasts. **Qi Jiang** and Ulrich Melcher, Department of Biochemistry and Molecular Biology, OSU
- 2:05 Binding and entry of influenza A viruses. **Stephen J. Stray**, Richard D. Cummings, and Gillian M. Air, Department of Biochemistry and Molecular Biology, UOHSC
- 2:25 The Active Streptococcal Hyaluronan Synthases (HASs) Contain a Single HAS Monomer and Multiple Cardiolipin Molecules. **Valarie L. Tlapak-Simmons**, Eilis S. Kemper, Bruce A. Baggensloss, and Paul H. Weigel, Department of Biochemistry and Molecular Biology, UOHSC
- 3:05 Hsp90 and cdc37: Gateways to Kinase Structure and Function. **Steven D. Hartson**, Department of Biochemistry and Molecular Biology, OSU
- 3:25 Beta-arrestin-1: a Possible Involvement in Modulation of Pain Sensation. **Naoka Komori**, Department of Biochemistry and Molecular Biology, UOHSC
- Poster Session:**
- *Nuclear Localization of the C1 Protein from Maize: **Shelley Shoemaker** and Terry Cluck, East Central University
- *Collegiate Academy, Undergraduate Paper Competition

SECTION K: MICROSCOPY
PRACTICAL ARTS BUILDING RM 201
MODERATOR: PHOEBE DOSS, OSU

MORNING SESSION:

- 8:20 Welcome. Explanation of Timpano Competition. **Phoebe Doss**, OSU
- 8:30 A Unique Filament Network in Vero Cells. **Steve Sands** and Bill Meek, OCOM.
- 8:45 Morphological Changes in a Vancomycin Resistant *Staphylococcus aureus* derived from a MRSA strain through Step-Wise Adaptation. **Marvita D. McGuire**, Stephanie Wright, Robert S. Conrad, OCOM.
- 9:00 Freeze-substitution of *Brassica* anthers for preserving *Bra r 1*, a pollen allergenic protein. **Z. Zhang**, T. Okada, K. Toriyama, S.D. Russell, OU.
- 9:15 Immunohistochemical Localization of Two O-Methyltransferases in Lignin Biosynthesis in Alfalfa (*Medicago sativa* L.). **Rossio Kersy**, Kentaro Inoue, Richard A. Dixon, Karel Schubert, OU.
- 9:30 **Break**
- 9:45 Ultrastructural characterization of apoptosis in bovine lymphocytes induced by *Pasteurella haemolytica* leukotoxin. **Y. Sun**, K.D. Clinkenbeard, C.L. Ownby, L. Cudd, and S.K. Highlander, OSU.
- 10:00 Utilization of TEM in the Study of Canine Hepatozoonosis. **C.A. Cummings**, R.J. Panciera, K.M. Kocan, and S.A. Ewing, OSU.
- 10:15 Comparison of Hexamethyldisilazane and Critical Point Drying on Surface Structure of *Nicotiana tabacum* Pollen Tubes. **Shelby Mattison**, Scott Russell, OU.
- 11:00 **Section K Business Meeting**
- 11:10 **Announcement of Timpano Competition Winner.** **Phoebe Doss**
- 11:15 **Ugly Bug Update.** Paige Johnson, Educational Outreach Chair, Conoco Inc., Followed by OMS Executive Meeting, LUNCH, OMS General Meeting
- 11:20 **All Academy Business Meeting** PA 307
- 12:00 **All Academy Awards Banquet** UC Ballroom

SECTION K: MICROSCOPY
PRACTICAL ARTS BUILDING RM 201
MODERATOR-WILLIAM CHISSOE

AFTERNOON SESSION:

- 1:30 Scanning Probe Microscopy: a Review for the Oklahoma Microscopy Society. **M.B. Johnson, OU.**
- 2:30 Break
- 2:45 Advantages of Using Computer-Based Slide Shows. **Ginger Baker, OCOM.**
- 3:00 Rerearning How to do Microscopy in a Molecular Biology Lab in Australia. **Scott D. Russell, OU.**

SECTION L: MATHEMATICS AND COMPUTER SCIENCE
PRACTICAL ARTS BUILDING RM 219

Despite the best efforts of the Section Chair, Dr. Karla Oty, no members of this section had submitted titles by the time this program booklet had to be printed. In the event that you submitted a paper title after the deadline posted in the August 1998 Newsletter, your paper may still be presented. It will be slightly inconvenient but you should continue to correspond with your section chair. Department of Mathematics, Southeastern Oklahoma State University, Durant, OK 74701. (580) 924 0121; e-mail: koty@sosu.edu. Continue your effort to produce a program even if it cannot be published in this booklet. Make multiple copies of the program you create. Place some at the registration desk on November 14. Post a copy on the door of the room assigned to your section. Have copies available for distribution in the meeting room.

SECTION M: ENVIRONMENTAL SCIENCE AND PLANNING
PRACTICAL ARTS BUILDING RM 304
MODERATOR: CHARLES L. LEIDER, OKLAHOMA STATE UNIVERSITY

Morning Session:

- 9:00 Yesterday's Trash, Today's Archeology: A Growing Problem in Cultural Resource Management and Project Planning. **John Hartley.**
- 9:15 Landscape Architects Improve Decision Making Through Development of Computer-Aided Design. **Matthew J. Kirkwood**
- 9:30 Sustainable Rural Communities: Potential Strategies for Conservation of Resources. **John R. Ritter.**
- 9:45 *Comparing Design Aspects of the Renaissance to the Romantic Period in Landscape Architecture. **Mark Minton.**
- 10:00 Coffee Break
- 10:15 *Dan Kiley: Disciple of Modern Movement in Landscape Architecture. **James L. Heath.**
- 10:30 *Father of Modernism in Landscape Architecture. **Larry H. Vinson.**
- 10:45 Environmental Science and Planning Business Meeting.
 Elect a section chair and vice chair.
 11:20 OAS Annual Business Meeting PA 307
 12:00 All Academy Awards Banquet U.C. Ballroom
- AFTERNOON SESSION:
- 1:45 *Thomas Church: Leading Residential Landscape Architect. **Angela McLaury.**
- 2:00 *Luis Barragan: Latin American Design Influences. **Kristine J. Pope.**
- 2:15 *Lawrence Halprin: Landscape Architecture and Modern Urban Development. **Kerman D. Raines.**
- 2:30 *Martha Schwartz: Landscape Architect/Landscape Artist. **Debra S. Myers.**
- 2:45 *Landscape Architecture Elements in the Woodlands. **Anne E. Oringderff.**
- 3:00 *GIS Application in Landscape Architecture. **Frank Hutto.**
- 3:15 *Collegiate Academy (Undergraduate) Papers
 Coffee Break
- 3:30 Tulsa Rose Garden: A Historic Landscape. **Charles L. Leider.**

SECTION N: BIOMEDICAL SCIENCES
PRACTICAL ARTS BUILDING RM 305
MODERATOR : JOHN J. DMYTRYK, OUHSC

MORNING SESSION:

- 9:00 Characterization of a vancomycin resistant staphylococcus aureus derived by step-wise adaptation. **Marvita D. McGuire**, Stephanie A. Wright, Robert S. Conrad. Tulsa Community College and OSU-COM.
- 9:15 Alteration in biological activity of bacteria as a function of growth media and antimicrobial susceptibilities. **Patrice E. Mooney**, Jay W. Bullard, Robert S. Conrad. OSU College of Osteopathic Medicine.
- 9:30 Flexural Properties of Selected Dental Bonding Resins. **Sharukh S. Khajotia**, Byeong R. Kim, Manville G. Duncanson, Jr., and Terry J. Fruits. University of Oklahoma College of Dentistry
- 9:45 The microplate histamine release assay. **Joseph A. Price**, William A. Coberly. OSU College of Osteopathic Medicine.
- 10:00 Break
- 10:15 Effect of exercise on serum carnitine levels. **Robert Leheew**, Marva Volk, M.S., Martin Banschbach, Ph.D. OSU College of Osteopathic Medicine.
- 10:30 Serum carnitine levels in vegetarians. **Scott Davis**, Marva Volk, M.S., Martin Banschbach, Ph.D. OSU College of Osteopathic Medicine
- 10:45 Investigating the mechanism of sodium and water absorption in the kidney. **Connie A. Herbert**, Al J. Rouch. OSU College of Osteopathic Medicine.
- 11:00 Section Business Meeting
- 11:20 Academy Business Meeting
- 11:30 Concurrent Poster Session, University Center Lobby
 * Characterization of ALY and determination of its function in post-replication repair. **Mathew B. Judkins**. East Central University (Mentors: Charles Biles and Charles Walden, East Central University).
- 12:00 OAS Awards Banquet, University Center Ballroom

SECTION N: BIOMEDICAL SCIENCES
PRACTICAL ARTS BUILDING RM 305
MODERATOR : ROBERT S. CONRAD, OSU COM

AFTERNOON SESSION:

- 1:45 Requirements for Langerhans cell migration from mouse ear skin. **Minh Pham**, **Kim Burnham**. OSU, Department of Microbiology.
- 2:00 Naegleria fowleri isolated from a case of primary amebic meningoencephalitis in Oklahoma. **Marsha J. Howard**, David T. John. OSU COM.
- 2:15 Characterization of an environmental pathogenic Acanthamoeba isolate. **Heather D. Rupe**, Marsha J. Howard, David T. John. OSU COM.
- 2:30 The unireceptor hypothesis of opioid antinociception in amphibians. **Leslie C. Newman**, David R. Wallace, Craig W. Stevens. OSU COM.
- 2:45 Presynaptic alpha-2 receptors mediating pupillary constriction in Rana pipiens. **George M. Brenner**, Leslie C. Newman, Craig W. Stevens. OSU COM.
- 3:00 Break
- 3:15 * Matrix Metalloproteinase Involvement in Endothelial Cell Morphogenesis. **Eric Phelps**. Oklahoma Christian University. (Mentor: Eric Howard, OUHSC).
- 3:30 * PPAR ligands in a breast cancer model. **Bill Novosod**. Oklahoma Christian University (Mentor: Jeff Gimble, OUHSC)
- 3:45 * Culturing human alveolar A549 Type II epithelial cells in vitro. **SuzAnn M. Musgrove**. Southeastern Oklahoma State University. (Mentors: Rick Wright, SOSU and Rick Rogers, Harvard)
- * denotes Collegiate Academy (undergraduate) papers

OPBS

Oklahoma Partners for Biological Sciences

(Funded by the Howard Hughes Medical Institute)

OPBS-at-OAS Meeting

November 14, 1998

Room PA 121

2:00-3:00 p. m.

Northeastern State University
Tahlequah, OK

Students and instructors participating in the
Fall 1998 OPBS Program will meet informally for:

introductions
exchange of ideas
questions and answers
discussion of research projects

Please join us!

OJAS RESEARCH WORKSHOP AND POSTER COMPETITION

for Science Teachers, High School, and Junior High Students

November 14, 1998

Practical Arts Building

Northeastern State University, Tahlequah, Oklahoma

WORKSHOP SCHEDULE

7:30 - 8:30 a.m. Registration and Refreshment, Room 307
8:30 - 8:45 a.m. Welcome, Joe D. Ferguson, Director OJAS
8:45 - 9:15 a.m. OJAS Business Meeting with Student Members and Coordinating Teachers, and OJAS Director.

9:15 - 9:50 a.m. Video Presentation "Science Projects for Junior High".

The emphasis in this presentation is to encourage the students to complete an experimental type of project.

10:00 - 10:45 a.m. Video Presentation "Switch On To Science".

The emphasis in this presentation is at the High School level, which are more research-oriented and may require a substantial amount of time and energy.

10:45 - 11:30 a.m. Students and Teachers are encouraged to attend any of the OAS paper sessions. Please check your program for titles of interest.

11:30 - 12:30 p.m. Lunch on your own. There is food service available at the Student Union on campus and fast food outlets just off campus.

12:30 - 5:00 p.m. Students and Teachers are encouraged to attend any of the OAS paper sessions in the areas listed below. Please check your program for titles of interest.

12:30 - 1:05 p.m. Video Presentation "You Be The Judge". The emphasis is on experimental types of projects and the program is a step-by-step approach on how to decide what to do and then how to do it right.

1:15 - 2:05 p.m. Video Presentation "Science Projects and Fairs: Tips for Teachers".

2:15 - 2:50 p.m. Video Presentation "Invent It".

POSTER COMPETITION SCHEDULE

7:30 - 8:30 a.m. Registration and Refreshment, Room 307

8:30 - 8:45 a.m. Welcome, Joe D. Ferguson, Director OJAS

8:45 - 9:15 a.m. OJAS Business Meeting with Student Members and Coordinating Teachers, and OJAS Director.

9:15 a.m. - 10:00 a.m. Poster setup - Display area

10:00 a.m. - 11:30 a.m. Morning Poster Display and Stand-by to Answer Questions.

11:30 a.m. - 12:30 p.m. Lunch on your own. There is food service available at the Student Union on campus and fast food outlets just off campus.

12:30 a.m. - 2:00 a.m. Afternoon Poster Display and Stand-by to Answer Questions.

2:10 p.m. - 2:30 p.m. Awards Ceremonies

2:30 p.m. - 3:30 p.m. Break Down and Clean Up

Changes to the Program May be announced at the meeting.

Abraham, K.J.	19	Gilbert, M.C.	10	Levesque, L.P.	8	Rogers, R.	25
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Brigham, D.L.	20	Highlander, S.K.	21	Mecher, U.	20	Shoenaker, S.	20
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NOTES

NOTES

OKLAHOMA ACADEMY OF SCIENCE PRESIDENTS

1910	H. L. Lane, OU	1953	S. P. Massey, LU
1911	D. W. Ohern, OKC	1954	A. N. Murray, TU
1912	S. W. Reeves, OU	1955	R. F. Olson, OU
1913	C. W. Shannon, OU	1956	A. M. Stebler, OAMC
1914	No meeting	1957	D. E. Howell, OAMC
1915	C. W. Shannon, OU	1958	G. J. Goodman, OU
1916	C. N. Gould, OU	1959	Elmer Lucas, OU
1917	L. C. Raiford, Iowa State	1960	P. E. Smith, OUMS
1918	No meeting	1961	E. M. Hodnett, OSU
1919	No Meeting	1962	H. B. Barclay, TU
1920	M. M. Wickham, Norman	1963	G. A. Moore, OSU
1921	A. F. Reiter, PU	1964	A. D. Buck, NOJC
1922	J. B. Thoburn, OKC	1965	J. E. Webster, OSU
1923	R. O. Whitten, OAMC	1966	C. R. Williams, PU
1924	S. Weidman, OU	1967	C. D. Riggs, OU
1925	(Spring) C. E. Sandborn	1968	F. A. Reynolds, SWSC
1926	(Fall) H. I. Dodge, OU	1969	L. V. Scott, OUHSC
1927	J. H. Gould, OAMC	1970	C. C. Carpenter, OU
1928	C. N. Gould, OU	1971	Paul Buck, TU
1929	O. M. Smith, OAMC	1972	W. A. Carter, ECSU
1930	A. Richards, OU	1973	C. J. Mankin, OU
1931	Leroy Long, OKC	1974	N. N. Durham, OSU
1932	A. O. Weese, OU	1975	Barbara Shirley, TU
1933	Herbert Patterson, OAMC	1976	G. W. Todd, OSU
1934	J. E. Knowles, PU	1977	D. E. Kizer, SFNF
1935	F. G. Brooks, OCU	1978	George, Odell, OSU
1936	C. E. Decker, OU	1979	Richard Couch, ORU
1937	H. J. Harper, OAMC	1980	Gary Wolgamott, SWSU
1938	B. D. Barclay, TU	1981	Elroy Rice, OU
1939	C. M. Perry, OU	1982	Everett Grigsby, NSU
1940	H. D. Chase, TU	1983	Jack Sokatch, OUHSC
1941	G. L. Cross, OU	1984	Mary Whitmore, OU
1942	R. W. Jones, OAMC	1985	Jeff Black, OBU
1943	H. I. Featherly, OAMC	1986	Jerry Wilkin, OSU
1944	O. F. Evans, OU	1987	Manford K. Patterson, SFNF
1945	V. G. Heller, OAMC	1988	Mary P. Carpenter, OU
1946	J. R. Nelson, OU	1989-1990	Kenneth E. Conway, OSU
1947	O. C. Derner, OAMC	1991-1992	James K. McPherson, OSU
1948	J. T. Self, OU	1993	James R. Estes, OU
1949	L. S. McLeod, TU	1994-1996	Jack D. Tyler, Cameron U
1950	J. C. Shirley, PU	1997-1998	Conie Taylor, SOSU
1951	Howard Taylor, OCV	1998-2000	Ronald J. Tyrl, OSU
1952	H. W. Larsh, OU	2001-2002	David Bass, UCO
	V. B. Monnett, OAMC		

OKLAHOMA ACADEMY OF SCIENCE
87TH ANNUAL TECHNICAL MEETING
NORTHEASTERN STATE UNIVERSITY
SATURDAY, NOVEMBER 14, 1998
REGISTRATION FORM
Register only one person per sheet.

NAME _____ SCHOOL AFFILIATION _____
Address (last) (first) (initial) _____ University, School
Dept., Bldg., and/or Street address _____ City _____ state _____ zip _____

REGISTRATION FEE	PREREGISTER	ON SITE	You fill in the amount
Professional Members*	\$10.00	\$15.00	_____
Professional Nonmember	\$15.00	\$20.00	_____
Student Members*	\$5.00	\$10.00	_____
Student Nonmember	\$7.50	\$10.00	_____

*If 1998 dues are paid

ALL ACADEMY BANQUET
Speaker: Dr. James M. "Mitt" Heftin,
NASA Space Flight Director

"Human Space Flight-Where in the Heavens Are We Going?"
Banquet Admission \$15.00

Availability is limited.

Membership Dues**	
Regular Membership	\$25.00
Family Membership	\$30.00
Student Membership	\$ 5.00
Check#	Total Remitted

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** Memberships purchased or renewed at the registration desk will entitle you to the member rate for the registration fee.
New Members please, furnish the following to ensure essential future communication.

THE OKLAHOMA ACADEMY OF SCIENCE
1999 MEMBERSHIP APPLICATION

Name _____ School Affiliation (if any) _____
(last) (first) (mi) _____ (University, College, High School, etc)
Professional Address (when applicable) _____
Dept., Bldg. Office etc. (if necessary for campus mail delivery)
OR not both _____

Mailing Address (necessary for home delivery) _____ (city) _____ (state) _____ (zip) _____
☐ Check For Home Delivery (Street, P.O. Box, Route etc.) (city) (state) (zip)
Telephone () _____ E-Mail _____

Membership Type: ☐ Life \$300 ☐ Professional \$25 ☐ Family \$30 ☐ Graduate \$5 ☐ Collegiate \$5 ☐ Junior \$5

Section Affiliations: Number no more than three areas of interest. 1=first choice; 2=second choice; 3=third choice
A Biological Sciences _____ E Science Education _____ J Engineering Sciences _____ M Environmental Sci.
B Geology _____ F Geography _____ K Biochemistry, Biophysics _____ N Biomedical Science
C Physical Sciences _____ G Fish and Wildlife _____ L Microscopy _____ Y Collegiate Academy
D Social Sciences _____ H Microbiology _____ L Mathematics, Computer _____ Z Junior Academy

