

1991

## 75 Annual Meeting, 1991. Secretary's Report and Financial Statement

Academy Editors

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# PROCEEDINGS ARKANSAS ACADEMY OF SCIENCE

Volume XXXV

1991

Robert Watson  
President

Michael W. Rapp  
President-Elect

John D. Rickett  
Secretary

Robert Wiley  
Treasurer

NAAS Delegate

Henry Robison  
Historian

## Secretary's Report

### MINUTES OF THE SEVENTY-FOURTH MEETING - APRIL 1991

#### FIRST BUSINESS MEETING

The meeting was called to order at 11:43 by President Watson.

1. Watson called for a representative of the Local Arrangements Committee or UAF to welcome the Academy; no response.
2. Watson recognized the Historian, H.W. Robison for a statement. This is the 75th Meeting of the Academy, the 12th time in Fayetteville. Observe the display of Academy history; Robison plans to set up this display at each annual meeting and still would like to have pictures and historical sketches.
3. Watson recognized the Secretary for the distribution of the minutes of last year's meetings and opportunity for questions and corrections. Any corrections should be submitted to me Secretary in written form before the second business meeting. Secretary also requested any motions, announcements and resolutions to be submitted in written form.
4. Watson recognized the Treasurer, Robert Wiley, for distribution and explanation of the financial report. No questions or comments came forth. Watson appointed an Auditing Committee, Stan Trauth (ASU), David Saugy (USFS), and Maurice Kleve (UALR), who will examine Wiley's books and report at the second business meeting.

#### ARKANSAS ACADEMY OF SCIENCE ANNUAL FINANCIAL STATEMENT (20 MARCH 1990 TO 20 MARCH 1991)

ANNUAL MEETING 5-6 APRIL 1991  
UNIVERSITY OF ARKANSAS, FAYETTEVILLE, AR

#### FUNDS


Balance Approved by Audit on 7 April 1990		16,863.31
Total Income (Page 2)	13,970.40	
Total Expenses (Page 3)	- 9,715.68	
Balance for the Year	4,254.72	4,254.72
<b>TOTAL FUNDS AS OF 20 MARCH 1991</b>		<b>\$21,118.03</b>

#### DISTRIBUTION OF ACCOUNTS

Interest Bearing Checking Account (Union Bank and Trust Co., Monticello, AR)		2,797.36
Certificates of Deposit		
Dwight Moore Endowment (Heritage Federal Savings and Loan - Monticello - No. 504891 - 6.80% Interest)	1,730.68	

Life Membership Endowment (Heritage Federal Savings and Loan - Monticello - No. 504883 - 6.80% Interest)	8,144.90
AAS Endowment (Heritage Federal Savings and Loan - Monticello - No. 507912 - 7.80% Interest)	4,845.09
AAS General CD (Heritage Federal Savings and Loan - Monticello - No. 507920 - 7.80% Interest)	3,600.00
<b>TOTAL</b>	<b>\$21,118.03</b>

Respectfully Submitted,

  
Robert W. Wiley, AAS Treasurer

Page 2. Financial Statement, Arkansas Academy of Science

INCOME: 20 March 1990 to 20 March 1991

1. INDIVIDUAL MEMBERSHIPS		
a. Regular	2,700.00	
b. Sustaining	240.00	
c. Sponsoring	90.00	
d. Life	550.00	
e. Associate	40.00	
	3,620.00	3,620.00
2. INSTITUTIONAL MEMBERSHIPS		2,100.00
3. PROCEEDINGS, LIBRARY SUBSCRIPTIONS		453.00
4. PROCEEDINGS, MISC. SALES (UAF)		2,174.46
5. PROCEEDINGS, PAGE CHARGES		2,750.00
6. ANNUAL MEETING: ARKANSAS STATE UNIVERSITY - 6-7 APRIL 1990		1,640.25
7. INTEREST		
a. Interest Bearing Checking Account	88.35	
b. Dwight Moore Endowment	116.79	
c. Life Membership Endowment	604.34	
d. AAS Endowment	73.65	
	883.12	883.12
8. ENDOWMENT DONATIONS		
a. Dwight Moore Endowment	125.00	
b. AAS Endowment - Unrestricted	100.00	
	225.00	225.00
9. MISCELLANEOUS		124.57
<b>TOTAL INCOME</b>		<b>\$13,970.40</b>

## Arkansas Academy of Science

Page 3. Financial Statement, Arkansas Academy of Science

EXPENSES: 20 March 1990 to 20 March 1991

## 1. AWARDS

a. Theresa Hines (#556)	50.00	
b. S. Alzaain (#557)	50.00	
c. John D. Peck, Plaque - Arkansas Science Talent Search (#558)	63.60	
d. Arkansas Junior Academy of Science (#555)	250.00	
e. Arkansas Science Fair Association (#554)	200.00	
	613.60	613.60

## 2. PROCEEDINGS

a. Phillips Litho (Vol. 43) (#551)	107.90	
b. Phillips Litho (Vol. 43) (#559)	8,057.24	
c. Linda Lee, Editorial Consultant Vol. 43 (#552)	500.00	
	8,665.14	8,665.14

## 3. OFFICE EXPENSES

a. Secretary's Office John Rickett (#561)	248.78	
b. Treasurer's Office Postmaster (#560)	25.00	
	273.78	273.78

## 4. ANNUAL MEETING EXPENSES (ASU)

a. Mr. Trophy (#553)		43.24
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## 5. NEWSLETTERS

a. University of Arkansas, Forest Research (#565)		63.35
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## 6. DUES

a. National Association of Academies of Science (#564)		28.00
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## 7. SERVICE CHARGE

11.90

## 8. MISCELLANEOUS (#562)

16.67

## TOTAL EXPENSES

\$9,715.68

(Rapp; 2nd H. Barton) the Academy appropriate \$250 to provide scholarship awards to winners at the Junior Academy of Science Meeting later this month.

c. Arkansas/Westinghouse Science Talent Search (for John Peck): First place winner was Christopher Brazzel, Pine Bluff High School with the paper, "The Grand Unified Field Theory", and sponsored by Mrs. Jewell Whatley. Second place winner was Ward Daniel Cook, Little Rock Central High School, with the paper, "What are the Nuclear Excited States of Neon-20?", sponsored by Mrs. Annice Steadman, Mrs. Jacqueline Dyer and Dr. Andre Rollefson. Motion: (Rapp, 2nd T. Palko) the Academy appropriate \$150 to recognize the two winners of the talent search and their sponsors. Watson announced the winner at last year's Junior Academy meeting will present the paper at this meeting of the Senior Academy.

8. Watson recognized the Director of the Junior Science and Humanities Symposium, Tom Palko, for a report. The meeting was held 15-17 March, and 114 students and 35 teachers submitted 73 papers, 15 of which were selected to be presented orally. The highlight of the meeting was a four-hour barge trip on the Arkansas River sponsored by the U.S. Corps of Engineers. Last year's national competition was won by an Arkansan, Jesse Sang, Little Rock Central High School, who received a two-week trip to London, England. This year's Arkansas representative to the national competition will be Edith Apple from North Little Rock with the paper, "Hierarchy of Navigation in Red Ants."

9. Watson gave a report from the Nominating Committee; George Harp was submitted as nominee for Vice-President. Opportunity was provided for nominations from the floor, but none came.

10. Watson relayed the report from Leo Paulissen of the Biota Survey Committee. New addenda are being prepared, but none are available at this time.

11. Watson gave a report on the new composition of the Science Education Committee - 12 members, three year terms, four members rotate off each year. There will be a meeting this afternoon after the paper sessions. New members are Tom Lynch, Chair; Bonnie Moody (Henderson State University); Rudy Timmerman (Rich Mountain Community College); and Dalena Tull (University of Central Arkansas). Watson asked Lynch to read the list of the other members.

12. Motion: (Rickett; 2nd T. Palko) the Executive Committee at the Fall 1990 meeting approved the raising of "Associate" membership dues from \$5 to \$10. But the category name should be also be labelled as undergraduate. This will be voted on during the second business meeting.

13. Watson appointed a Resolutions Committee consisting of Robert Wright, Mike Plummer and John Sorensen.

14. Watson announced the acceptance by the Executive Committee of the invitation from the University of Central Arkansas to host the 1992 meeting. We have not received an invitation for the 1993 meeting.

15. Watson encouraged the section chairpersons to keep their paper presentations on time.

16. Watson announced that the Arkansas Science Teachers Association is meeting in conjunction with the Academy. We welcome them and hope their efforts are productive.

17. Watson, in lieu of a representative of the Local Arrangements Committee, announced the banquet. Dr. Terry Cole (NASA) will

5. Watson recognized the *Proceedings* Editor, Harvey Barton, for a report. Individuals pick their copy of the journal and would a representative from each campus return with unclaimed copies going to that campus. Editors should gather manuscripts at the conclusion of paper sessions. Motion: (Barton; 2nd A. Johnson) the Academy appropriate \$500 for editorial assistance to prepare volume 45 (1991) of the *Proceedings*.

6. Watson recognized the *Newsletter* Editor, Dick Kluender, for a report. The cost to the Academy was postage (\$63.35); the Department of Forest Resources (UAM) supports the printing. Thanks R. Wiley for proofreading and J. Rickett for providing mailing labels. Motion: (Kluender; 2nd D. Saugey) the Academy appropriate \$650 to support production of the *Newsletter* in case the next editor cannot find in-house support to this extent.

7. Watson recognized the Director of Science Fairs, Mike Rapp, for a report.

a. Science Fairs: reported on the participation by students and teachers in seven regional fairs and the International Science Fair. Motion: (Rapp; 2nd A. Johnson) the Academy appropriate \$320 to support the Arkansas Science Fair Association. Rapp also moved the Academy officially commend the seven regional science fair directors (2nd H. Barton) (letter attached).

b. Junior Academy of Science (for Pat Knighten): Motion:

## Secretary's Report

speak after dinner. Sigma Xi is sponsoring the banquet speaker. Everyone is invited to the social hour prior to the banquet.

18. Watson reported on the background and mechanics of the "logo contest." No interest shown yet, but it is still open. Wiley knows a graphic designer who might help us design a new logo. Watson also brought some samples of logos from other states.
19. Watson called for new business and hearing none, adjourned the meeting at 12:20.

## SECOND BUSINESS MEETING

President Watson called the meeting to order at 12:10 pm.

1. Watson called for corrections to and approval of minutes from last year's business meetings. No corrections were offered, and approval was by voice vote.
2. Watson recognized Stan Trauth for a report from the Auditing Committee. The committee found the Treasurer's books in order and moved the approval of the Treasurer's report for the year immediately past. Motion carried by voice vote.
3. Watson recognized Treasurer, Robert Wiley for a follow-up on his report in the first business meeting. No further questions came, and Wiley summarized by stating the Academy's financial status is as secure as it has been in recent years. Report approved by voice vote.
4. Watson recognized Secretary, John Rickett for a re-statement of the five motions for continued support:
  - a. H. Barton, editorial assistance: \$500
  - b. D. Kluender, *Newsletter*: up to \$650
  - c. M. Rapp, Science Fairs: \$320
  - d. M. Rapp (for P. Knighten), Junior Academy: \$250
  - e. M. Rapp (for John Peck), Westinghouse Talent Search: \$150

Motions approved as a group by voice vote.

5. Watson recognized the Secretary for a re-statement of the motion to raise "Associate" (Undergraduate) Membership category dues from \$5 to \$10. Motion passed by voice vote.
6. Watson recognized the Nominating Committee's submission of George Harp for Vice-President and opened the floor for further nominations. R. Spears moved G. Harp be elected by acclamation (2nd H. Barton). Motion carried by voice vote.
7. Watson recognized R. Wright for a report from the Resolutions Committee, who then read the following resolutions:

**Be it resolved that:** that the members of the Arkansas Academy of Science express their sincere appreciation to the faculty, staff and students of the University of Arkansas/Fayetteville for hosting our 1991 meeting. We especially thank Dr. John Hehr and his Local Arrangements Committee for all their efforts on behalf of the membership to make this meeting a success. Thanks are due to section chairs, individual presenters, faculty advisors, and judges of student papers. We also recognize the contributions of chapters of Sigma Xi and its individual members to the success of the meeting. Thanks are also extended to Robert Watson, President; Michael Rapp, President-Elect; Richard Spears, Past-President; the remaining officers and other members of the Executive Committee and other committees of the Academy whose cooperative efforts were so apparent during the meeting. Finally we thank Dr. Terry Cole for sharing with us the truly remarkable accomplishments of planetary exploration at the Jet Propulsion Laboratory.

**Be it resolved that:** the members of the Arkansas Academy of Science recognize Dr. Robbin Anderson for his dedicated service as chair of the Science Education Committee. His consistent alertness to legislative issues, government programs and regulations regarding science education has served us well. If he occasionally told us more than we wanted to hear, we probably needed to know it. Ever the gentleman, he has been our distinguished ambassador for science education. We thank him for his service.

**Be it resolved that:** the members of the Arkansas Academy of Science recognize Dr. Paul Krause for his work as Director of the Junior Academy of Science. Organizing and carrying out the annual meeting is a little like being the local arrangements chair for the Academy of Science year after year. And he has done a thoroughly professional job. His contribution toward encouraging and honoring high school students and teachers has made a difference in Arkansas, and we thank him.

8. Watson announced the University of Central Arkansas will host the 1992 Academy of Science. Decision was made at the fall 1991 meeting of the Executive Committee.
9. Watson recognized the Nominating Committee; Jim Daly (UAMS), Dan England (SAU), and Walt Godwin (UAM) and thanked them for their work.
10. Watson announced no invitation has been received yet for the Academy's 1993 meeting. We usually try to plan two years in advance. He solicited an invitation.
11. Watson recognized Leo Paulissen for a follow-up report on the Biota Survey. He is currently preparing a few new lists but doesn't have any ready at the present.
12. Watson called for New Business:
  - a. Announced (for H. Barton) for campus representatives to pick up unclaimed copies of the *Proceedings* and take them back with you. M. Rapp assisted in the disbursing these groups of journal copies.
  - b. Watson asked if the paper judges had made their final decision yet - no.
  - c. A comment from the floor pointed out that two different times publicized for the first business meeting caused some participants to miss it. President: point well taken.
  - d. A comment from the floor drew attention to an error in the journal's instructions to authors page.
  - e. Watson again recognized the Historian's efforts in assembling the historical display. He also reminded the membership to submit items of interest to H. Robison.
  - f. Watson again recognized the Audit Committee, Resolutions Committee, Science Education Committee, and the Judging Committee (Ed Dale, Nancy McCartney, John Dixon and Jeff Demaris). Watson personally thanked the members of the Executive Committee for their contributions during the past year and particularly Mike Rapp and John Rickett.
  - g. Watson recognized Mike Rapp and installed him as the new President. Rapp then presented Watson a plaque of recognition for last year's work as President. Rapp brought attention to a picture of a horsefly embossed on the plaque as representative of Watson's research interests, whereupon Watson replied with a statement about the horsefly's blood-sucking tendencies. A little levity doth lighten the spirit.

## Arkansas Academy of Science

13. M. Rapp, as new President, asked new members to rise and introduce themselves as evidence that the Academy of Science is a family. He also asked life members to rise and introduce themselves. He urged action by those who are willing to facilitate the work of the Academy and continue our tradition of excellence.
14. Rapp recognized John Sorensen who issued an appeal for Academy members to volunteer to judge science fairs.
15. Betty Spears asked Rapp to introduce our President-Elect, which he did – Art Johnson.
16. Jim Fribourgh asked about the status of the logo contest – Rapp replied no response yet, but it is still open.
17. Rapp placed the meeting in recess until the results of the student paper presentations judging are available.
18. Student winners announced were Annise Evans (UAPB-undergraduate) and Gary Fuller (UALR-GIT-graduate); announced by Ed Dale. Several members simultaneously raised a point of order that two undergraduate awards (life sciences and physical sciences) should be given. The committee will meet again and resolve the issue.
19. President Rapp adjourned the meeting at 12:46 pm.

## MEMBERS 1991

Roger	Abernathy	Arkansas State University	regular	Robert H.	Doater	University of Arkansas at Fayetteville	regular
Stephen R.	Addison	University of Central Arkansas	regular	Robert L.	Douglas	Memphis State University	regular
Sam	Al-Zaam	University of Arkansas at Little Rock	regular	Marian	Douglas	University of Arkansas at Little Rock	regular
Silke Hufangel	Allen	Hendrix College	regular	Mark	Draganjac	Arkansas State University	life
Robert T.	Allen	University of Arkansas at Fayetteville	regular	Benjamin T.	Duhart	University of Arkansas at Pine Bluff	regular
Robbin C.	Anderson	University of Arkansas at Fayetteville	life	David	Dussourd	University of Central Arkansas	regular
Cynthia	Annett	University of Arkansas at Fayetteville	regular	Edson	Edson	University of Arkansas at Monticello	sponsoring
John T.	Annulis	University of Arkansas at Monticello	regular	Rudolph J.	Eichenberger	Southern Arkansas University	regular
Edmond J.	Bacon	University of Arkansas at Monticello	life	Jim	Ekman	Southern Arkansas University	regular
Robert	Bacon	University of Arkansas at Fayetteville	regular	Hudson B.	Eldridge	University of Central Arkansas	regular
Claudia	Bailley	University of Arkansas at Fayetteville	regular	Robert	Engelken	Arkansas State University	regular
Max L.	Baker	University of Arkansas/Medical Center	regular	Daniel R.	England	Southern Arkansas University	life
Kenneth H.	Ball	El Dorado Public Schools	regular	Don	England	Harding University	regular
William H.	Baltosser	University of Arkansas at Little Rock	regular	Lawana	England-Whaley	Arkansas State University	sponsoring
Owen	Barber	Arkansas State University	sustaining	Carole	Engle	University of Arkansas at Pine Bluff	regular
Harvey E.	Barton	Henderson State University	regular	Claude E.	Epperson	University of Arkansas/Medical Center	regular
Adelphia M.	Basford	Henderson State University	regular	Ray	Erickson	U.S. Department of Agriculture	regular
Vernon	Bates	Arkansas State University	regular	William L.	Evans	University of Arkansas at Fayetteville	life
John Kenneth	Beadles	Arkansas State University	regular	Wilbur W.	Everett	Ouachita Baptist University	regular
Judith A.	Bean	Harmony Grove High School	sustaining	E. Kim	Fifar	University of Arkansas/Medical Center	regular
Ashley	Bean	Hendrix College	regular	Sheldon	Fitzpatrick	University of Arkansas at Pine Bluff	sustaining
John B.	Bennett	Arkansas State University	sustaining	M. Doug	Fletcher	Riceland Foods Inc. (ASU)	regular
Ann Marie	Benson	University of Arkansas/Medical Center	regular	Thomas H., III	Fletcher	University of Arkansas/Medical Center	associate
Hal	Berghel	University of Arkansas at Fayetteville	regular	E. P. (Perk)	Floyd	U.S. Public Health Service (regular)	regular
C.	Bhuvanawaran	University of Arkansas/Medical Center	regular	Thomas L.	Foti	Natural Heritage Commission	regular
Elsaine	Bickle	Northeast Louisiana State Univ	associate	Paul B.	Francis	University of Arkansas at Monticello	regular
George T.	Blavins	University of Arkansas/Medical Center	associate	Winifred	Fraser	Arkansas College	regular
Veryl	Board	Arkansas College	regular	Kenneth	Freiley	University of Central Arkansas	regular
Marilyn	Bockanick	Arkansas Tech University	regular	James H.	Fribourgh	University of Arkansas at Little Rock	life
Laurence J.	Boucher	Arkansas State University	regular	Arthur	Fry	University of Arkansas at Fayetteville	life
William R.	Bowen	University of Arkansas at Little Rock	regular	Gary	Fuller	University of Arkansas at Little Rock	regular
Robert E.	Bowling	University of Arkansas/Medical Center	sustaining	Kamesh	Gadepally	University of Arkansas at Little Rock	regular
Leo H.	Bowman	Arkansas Tech University	regular	Charlie	Gagen	Arkansas Tech University	regular
Patricia	Brackin	Christian Brothers College	regular	Jack	Gaiser	University of Central Arkansas	regular
Jimmy D.	Bragg	Henderson State University	regular	Diana	Garland	Memphis State University	regular
Wilfred J.	Braithwaite	University of Arkansas at Little Rock	regular	Jane P.	Gentry	Arkansas Science & Technology	regular
Marge A.	Brewster	Arkansas Childrens Hospital	regular	Michael	George	Arkansas State University	regular
John F.	Bridgman	University of the Ozarks	regular	Collis R.	Geren	University of Arkansas at Fayetteville	life
Arthur V.	Brown	University of Arkansas at Fayetteville	regular	John	Giese	Ark. Dept. of Pollution Control	life
Joseph M.	Brown	Mississippi State University	regular	Loren J.	Giesler	Chadron State College	associate
Susan G.	Brown	University of Arkansas at Little Rock	regular	John T.	Gilmour	University of Arkansas at Fayetteville	regular
William D.	Brown	University of Arkansas at Fayetteville	regular	Mattie	Glover	University of Arkansas at Pine Bluff	regular
Charles T.	Bryant	Water Resources of Arkansas	regular	David	Goad	University of Arkansas at Little Rock	associate
Gaylen	Burnside	University of Arkansas at Little Rock	regular	Walter E.	Godwin	University of Arkansas at Monticello	life
Jody	Caldwell	University of Arkansas at Little Rock	regular	Kevin D.	Golden	University of Arkansas at Fayetteville	associate
Chris	Carlton	University of Arkansas at Fayetteville	regular	William E.	Gran	University of Arkansas at Little Rock	regular
Phyllis	Chaffin	Arkansas State University	regular	Wayne L.	Gray	University of Arkansas/Medical Center	regular
Stanley L.	Chapman	University of Arkansas at Fayetteville	regular	Robert A.	Green	Mississippi State University	regular
David	Chittenden	Arkansas State University	life	Edmond E.	Griffin	University of Central Arkansas	regular
Cindy	Cisar	University of Arkansas at Fayetteville	regular	Gaston	Griggs	John Brown University	regular
Frances E.	Clayton	University of Arkansas at Fayetteville	regular	Mark	Gross	University of Arkansas at Little Rock	regular
Malcolm K.	Cleaveland	University of Arkansas at Fayetteville	sustaining	Peggy	Guccione	University of Arkansas at Fayetteville	regular
Betty S.	Cochran	U.S. Forest Service	regular	Joe M.	Gunter	University of Arkansas at Monticello	life
Lorris G.	Cockerham	NCTR Associated Universities	sponsoring	Rao P.	Gullapalli	University of Arkansas at Little Rock	regular
Richard R.	Cohon	Arkansas Tech University	regular	Paul D.	Gwinup	Arkansas State University	regular
Larry	Coleman	University of Arkansas at Little Rock	regular	Bruce	Haggard	Hendrix College	regular
B. Lilia	Compadre	University of Arkansas/Medical Center	regular	Jeffrey R.	Hammersley	UAMS/UALR	regular
Robert L.	Cook	Mississippi State University	regular	Earl L.	Hanebrink	Arkansas State University	regular
Janice Lorraine	Cooper	Arkansas State University	regular	B. J.	Hankins	University of Arkansas at Fayetteville	regular
Robert M.	Cordova	Cordco Consulting	regular	Richard H.	Hanson	University of Arkansas at Little Rock	regular
Calvin	Coston	Geographica Silk Screening Co.	sponsoring	George L.	Hardin	Hendrix College	regular
William	Coutts	University of Arkansas at Little Rock	regular	Harp	Harp	Arkansas State University	sponsoring
Bob W.	Cowling	Malvern High School	regular	Phoebe A.	Harp	Arkansas State University	sponsoring
Robert M.	Crisp, Jr.	University of Arkansas at Fayetteville	regular	John L.	Harris	Arkansas Highway & Transport	regular
Donald	Culwell	University of Central Arkansas	sustaining	Michael J.	Harvey	Tennessee Tech University	regular
Edward E.	Dale, Jr.	University of Arkansas at Fayetteville	sustaining	Roger M.	Hawk	University of Arkansas at Little Rock	regular
Fred	Dalske	University of Central Arkansas	regular	Gary A.	Heidt	University of Arkansas at Little Rock	life
James J.	Daly	University of Arkansas/Medical Center	regular	Ronnie	Helms	University of Arkansas at Fayetteville	life
James T.	Daniels	Southern Arkansas University/T	regular	Christopher C.	Hemann	Hendrix College	associate
Jerry A.	Darsey	University of Arkansas at Little Rock	regular	Mustafa	Hemmati	Arkansas Tech University	regular
Pat	Darsey	Holy Souls Catholic School	regular	Burton	Henderson	University of Arkansas at Little Rock	regular
Stanley N.	David	Arkansas State University	regular	Larry	Hinck	Arkansas State University	regular
David L.	Davies	University of Arkansas/Medical Center	sponsoring	Dean	Hirschi	University of Central Arkansas	regular
Leo Carson	Davis	Southern Arkansas University	sponsoring	Maxine R.	Hite	University of Central Arkansas	regular
Jeffery R.	Demarest	University of Arkansas at Fayetteville	regular	Lisa J.	Hlass	U.S. Corps of Engineers	regular
Robert M.	Dilday	University of Arkansas at Fayetteville	life	Howard	Hodges	University of Arkansas at Little Rock	regular
Ronald H.	Doran	Harding University	regular	Kay	Holtman	University of Arkansas at Little Rock	regular
Peggy Rae	Dorris	Henderson State University	regular	William G.	Hood	University of Arkansas at Little Rock	regular



## Secretary's Report

Leater C.	Rowick	University of Arkansas at Faye	sponsoring	Mazo	University of Arkansas at Pine	regular
Arthur	Moyle, Jr.	University of Central Arkansas	regular	Denver L.	University of Central Arkansas	regular
Feng Hou	Huang	University of Arkansas at Faye	regular	S.	University of Arkansas/Medical	regular
M. Keith	Hudson	University of Arkansas at Litt	regular	Michael W.	University of Central Arkansas	Life
Jim	Huey	University of Arkansas at Mont	regular	Rapp	George Washington National For	regular
Julie	Huggins	Union University	regular	Rettig	University of the Ozarks	regular
Charles A.	Hughes	Arkansas State University	regular	Reynolds	Arkansas State University	regular
Raul	Hunkapiller	Phillips County Community Coll	regular	Richards	University of Arkansas at Litt	Life
Hyatt	Johnson	University of Arkansas at Faye	regular	Rickett	University of Arkansas at Litt	regular
Joseph U.	Igietseme	University of Arkansas/Medical	regular	Rimmer	Arkansas State University	regular
Duane	Jackson	University of Arkansas at Litt	regular	Roberts	Southern Arkansas University	Life
M. D.	Jalaluddin	University of Arkansas at Pine	regular	Robison	University of Arkansas/Medical	regular
Douglas	James	University of Arkansas at Faye	Life	Roop	Southern Arkansas University	regular
David	Jimerson	Arkansas State University	regular	Root	Southern Arkansas University	regular
Arthur A.	Johnson	Hendrix College	Life	Rothrock, III	University of Arkansas/Medical	regular
James E.	Johnson	University of Arkansas at Faye	regular	Rove	Stamps High School	regular
Michael I.	Johnson	Nettleton High School	regular	Russert-Kraemer	University of Arkansas at Faye	regular
Perry Max	Johnston	University of Arkansas at Faye	sustaining	Rosa I.	University of Arkansas/Medical	regular
Suzanne M.	Jones	Arkansas State University	regular	Sarkar	University of Arkansas/Medical	regular
Jay	Justice	Ark. Dept. Pollution Control &	regular	Saugey	U.S. Forest Service	Life
Ragupathy	Kannan	University of Arkansas at Faye	regular	Scallet	Nat. Center for Toxicological	regular
Alvan A.	Karlin	University of Arkansas at Litt	regular	Sealander	University of Arkansas at Faye	regular
Mark	Karnes	The Ross Foundation	regular	Setian	John Brown University	regular
Philip L.	Kehler	University of Arkansas at Litt	regular	Setliff	University of Arkansas at Litt	regular
Raj V.	Kilambi	University of Arkansas at Faye	regular	Seward	John Brown University	regular
Robert T.	Kirkwood	University of Central Arkansas	Life	Sewell	USDA-Soil Conservation Service	Life
Maurice G.	Kleve	University of Arkansas at Litt	regular	Shade	University of Arkansas at Mont	associate
Richard	Kluender	University of Arkansas at Mont	regular	Shahriar	Southern Arkansas University	regular
Roger E., III	Koeppe	University of Arkansas at Faye	regular	Shaikh	University of Arkansas at Litt	regular
Richard A.	Komoroshi	University of Arkansas/Medical	regular	Shanks	University of Arkansas at Litt	regular
Randall A.	Kopper	Hendrix College	regular	Sharrah	University of Arkansas at Faye	regular
Walter A.	Korfmecher	National Ctr. for Toxicologica	regular	Shepherd	Arkansas Natural Heritage Comm	regular
Timothy	Kral	University of Arkansas at Faye	regular	Siegel	University of Arkansas at Faye	regular
Paul	Krause	University of Central Arkansas	regular	Sifford	Arkansas State University	regular
Jack C.	Kraie	Fayetteville Public Schools	regular	Sims	University of Arkansas at Litt	regular
Timothy T.	Ku	University of Arkansas at Mont	regular	Slatten	NLR High School, East Campus	regular
Forrest E.	Lane	University of Arkansas at Faye	regular	Smith	University of Arkansas at Faye	regular
Norman	Lavers	Arkansas State University	regular	Smith	Governor's Office (attache)	regular
Linda A.	Lee	Pocahontas Middle School	regular	Smith	University of Arkansas at Faye	regular
Jerry L.	Linnstaedter	Arkansas State University	regular	Smith, Jr.	U.S.D.A./Univ. of Arkansas	regular
J. Mitchell	Lockhart	University of Arkansas at Faye	regular	Snow	Louisiana Tech University	regular
Thomas J.	Lynch	University of Arkansas at Litt	regular	Snyder	University of Arkansas at Faye	regular
Siripong	Malaari	Christian Brothers University	regular	Snyder	Arkansas Natural Heritage Comm	regular
Alli	Mansouri	University of Arkansas/Medical	regular	Sorensen	University of Arkansas/Medical	regular
Mitchell K.	Marks	Arkansas State University	regular	Spears	Quachita Mtns. Biological Stat	Life
Daniel L.	Marsh	Henderson State University	sustaining	Speight	Quachita Mtns. Biological Stat	Life
Michael L.	Martin	Arkansas State University	associate	Standage	University of Arkansas at Faye	regular
Herbert M.	Matthews	Henderson State University	regular	Steele	U.S. Forest Service	regular
Robin	Matthews	University of Arkansas at Litt	associate	Steigerwald	University of Arkansas at Faye	regular
Donald R.	Mattison	University of Pittsburgh	Life	Steinmeier	University of Arkansas at Mont	regular
M. K.	Mazumder	University of Arkansas at Litt	regular	Steward	Baptist Medical Center	regular
Chris T.	McAllister	Veterans Affairs Medical Cente	regular	Sundell	Arkansas State University	regular
Russell B.	McAllister	Arkansas State University	regular	Sutherland	University of Arkansas at Mont	sustaining
Nancy Glover	McCartney	University of Arkansas at Faye	regular	Sutton	Hendrix College	regular
Clark W.	McCarty	Quachita Baptist University (r	regular	Tappin	Hendrix College	regular
Rose	McConnell	University of Arkansas at Pine	regular	Taylor	University of Arkansas at Mont	regular
Noland E.	McDaniel	FTN Associates, Ltd.	sustaining	Taylor	University of Central Arkansas	regular
V. Rick	McDaniel	Arkansas State University	regular	Tadder	University of Arkansas at Faye	regular
Paul	McLeod	University of Arkansas at Litt	regular	Templeton	University of Arkansas at Faye	Life
Clarence E.	McMahon	(Hendrix College)	regular	Thompson	University of Arkansas at Faye	regular
Dennis W.	McMasters	Henderson State University	regular	Timmerman	Arkansas State University	regular
Harlan	McMillan	Arkansas Tech University	regular	Timmerman	Newark High School	regular
Pamela J.	McMillan	University of Arkansas/Medical	associate	Timmerman	Rich Mountain Community Colleg	regular
Tammie	McRae	National Ctr. for Toxicologica	regular	Torrans	University of Arkansas at Pine	regular
Rahul	Mehta	University of Central Arkansas	regular	Trauth	Arkansas State University	regular
Richard	Meyer	University of Arkansas at Faye	regular	Tucker	U.S. Forest Service	Life
Lawrence A.	Mink	Arkansas State University	regular	Turner	Henderson State University	regular
Angel	Mintz	University of Arkansas at Faye	associate	Turner	Quachita Baptist University	regular
Richard G.	Mitchell	Arkansas State University	regular	Ulrich	University of Arkansas at Faye	regular
Sanjay K.	Mitra	University of Arkansas at Litt	regular	Vere	Arkansas Tech University	regular
Roberta A.	Mittelstaedt	National Center for Tox. Resea	Life	Viewanathan	University of Arkansas at Litt	regular
Clamentine	Moore	Life		Vosburg	Arkansas State University	regular
Leland F.	Mofgans	University of Arkansas at Litt	regular	Wagner	Arkansas State University at Faye	regular
Stephen R.	Houlton, III	University of North Texas	regular	Walker	UAMS/McClellan VA Hospital	regular
Michael	Murphy	Arkansas State University	regular	Walker	University of Arkansas at Pine	regular
Joseph C.	Neal	University of Arkansas at Faye	regular	Walker	Arkansas Tech University	regular
Nathaniel	Nahas	Ark. Dept. Pollution Control &	regular	Walker	University of Arkansas at Litt	regular
Thomas	Nelson	Arkansas Tech University	regular	Wankum	University of Arkansas at Litt	regular
W. Donald	Newton	Arkansas State University	regular	Watson	University of Arkansas at Litt	sustaining
William F.	Nicholson	University of Arkansas at Mont	regular	Weaver	Veterans Administration Medica	sustaining
Alex R.	Nisbet	Quachita Baptist University	sustaining	Weaver	Arkansas State University	regular
Joe	Nix	Quachita Baptist University	regular	Weaver	University of Central Arkansas	regular
Gaylord M.	Northrop	University of Arkansas at Litt	regular	Webb	University of Arkansas at Mont	regular
Timothy J.	O'Brien	University of Arkansas/Medical	regular	Weidemann	University of Arkansas at Faye	regular
Larry A.	Olson	Arkansas State University	regular	Wennerstrom	University of Arkansas/Medical	regular
Derrick M.	Oosterhuis	University of Arkansas at Faye	regular	Wennerstrom	Pulaski Academy	associate
Tom	Palko	Arkansas Tech University	Life	Weyer	University of Arkansas at Faye	associate
Bryan D.	Palmer	Henderson State University	regular	White	Memphis State University	regular
Leo J.	Paulissen	University of Arkansas at Faye	regular	Wickliff	University of Arkansas at Faye	Life
Mark A.	Paulissen	Slippery Rock University	regular	Wigley	University of Arkansas at Mont	Life
John E.	Pauly	University of Arkansas/Medical	regular	Wiley	University of Arkansas at Mont	Life
Forrest	Payne	FTN Associates	regular	Wilhide	Arkansas State University	regular
Carol J.	Peck	University of Arkansas at Litt	Life	Willingham	University of Arkansas at Pine	regular
James H.	Peck	University of Arkansas at Litt	Life	Willis	Southern Arkansas University	regular
John D.	Peck	University of Central Arkansas	regular	Willis	University of Arkansas at Litt	associate
Bill	Pell	U.S. Forest Service	regular	Wilson, Jr.	Harding University	regular
Carlos H.	Pennington	USAE Waterways Experiment Stat	regular	Wolf	University of Arkansas at Faye	regular
Mark A.	Pippenger	University of Arkansas/Medical	regular	Woolverton	University of Central Arkansas	regular
Albert B.	Pittman	Arkansas Natural Heritage Comm	regular	Wright	University of Central Arkansas	regular
Michael V.	Plummer	Harding University	regular	Wu	University of Arkansas at Litt	regular
Roberta Dee	Pond	University of Arkansas at Faye	regular	Wyatt	Arkansas State University	regular
Donna	Porter	University of Arkansas at Faye	associate	Vaich	Arkansas Game & Fish Commissio	regular
Gayle L.	Pounds	University of Arkansas at Pine	regular	Yang	Arkansas Tech University	regular
Ervin W.	Powell	University of Arkansas/Medical	sustaining	Yang	University of Arkansas at Litt	regular
Harold	Pray	University of Central Arkansas	regular	York	University of Arkansas/Medical	regular
Alan D.	Price	Ark. Dept. Pollution Control &	sustaining	Young	Fayetteville Public Schools	regular

# PROGRAM

## Arkansas Academy of Science

Seventy-fifth Annual Meeting

5-6 April, 1991

University of Arkansas at Fayetteville

Fayetteville, Arkansas

Meeting concurrently with sessions of

The Collegiate Academy of Science

### Friday, 5 April, 1991

Registration  
Executive Committee  
First Business Meeting  
Exhibits and Refreshments

#### Paper Sessions

Students I - Botany/Ecology/Aquatics  
Botany I/ Biomedical  
Microbiology  
Physics/Engineering I  
Fish Biology

#### Hospitality Hour

Sponsored by University of Arkansas for Medical Sciences

#### Banquet

Speaker: Dr. Terry Cole

*Beauty on a Planetary Scale: A Summary of What Has Been  
Learned Through Remote Sensing of the Planets*

### Saturday, 6 April, 1991

Registration  
Exhibits and Refreshments  
Second Business Meeting

#### Paper Sessions

Students II - Vertebrates/Microbiology/Biomedical/  
Chemistry/Engineering  
Botany II/Science Education  
Aquatics/Invertebrates  
Chemistry/Engineering II  
Vertebrates/Geology

#### Sigma Xi Breakfast

The traditional Sigma Xi Breakfast will be held at the Ozark Mountain Smokehouse on Dickson Street on Saturday, 6 April, 1991, beginning at 7:00 am.