

TN
A. 37 & 38

JOURNAL

OF THE

Tennessee Academy of Science

VOLUME 78

NUMBER 1

CONTENTS

| | |
|---|----|
| President of the Tennessee Academy of Science for 2003 | 1 |
| Proceedings of the Tennessee Academy of Science 2002 | 3 |
| Executive Committee Meeting, April | 3 |
| Executive Committee Meeting, November | 9 |
| Tennessee Academy of Science 112th Annual Meeting | 16 |
| Host of the 112th Meeting: East Tennessee State University | 18 |
| Tennessee Academy of Science Awards: 2002 | 19 |
| Abstracts of Papers Presented at the 112th Meeting | 23 |
| Best Student Presentation Awards | 39 |
| New Members of the Tennessee Academy of Science: 2002 Membership Year | 41 |
| Presidents of the Tennessee Academy of Science, 1938–2003 | 42 |
| Books and New Media | 43 |
| Announcements | 44 |

JANUARY 2003

Tennessee Academy of Science

EXECUTIVE COMMITTEE

President

Karen Kendall-Fite
Math and Science Dept., Box 1315
Columbia State Comm. College
Columbia, TN 38402-1315

Past-president

Jack Rhoton
East Tennessee State Univ.
Box 70684
Johnson City, TN 37614-0684

President-elect

J. Michael Redding
Dept. of Biology
Tennessee Tech. Univ.
Cookeville, TN 38505

Secretary

Sarah H. Swain
Dept. of Biology, Box 60
Middle Tennessee State Univ.
Murfreesboro, TN 37132

Treasurer

John W. Harris
Dept. of Biology
Tennessee Tech. Univ.
Cookeville, TN 38505

Managing Editor

M. Gore Ervin
Dept. of Biology, Box 60
Middle Tennessee State Univ.
Murfreesboro, TN 37132

Meeting Coordinator

J. Michael Redding
Dept. of Biology
Tennessee Tech. Univ.
Cookeville, TN 38505

Dept. of Education Liaison

Linda Jordan
8th Floor, Gateway Plaza
710 James Robertson Pkw.
Nashville, TN 37243-0379

Director, Junior Academy

Jack Rhoton
East Tennessee State Univ.
Box 70684
Johnson City, TN 37614-0684

Director, Collegiate Division

Fred Matthews
Dept. of Chemistry
Austin Peay State Univ.
Clarksville, TN 37044

Director, Electronic Communication

James Howard
Dept. of Chemistry
Middle Tennessee State Univ.
Murfreesboro, TN 37132

Director, Visiting Scientist Prog.

Michael L. Daley
Dept. of Electrical Engineering
The Univ. of Memphis
Memphis, TN 38152

Chair, Education

Cindi Smith-Walters
Dept. of Biology, Box 60
Middle Tennessee State Univ.
Murfreesboro, TN 37132

Chair, Financial Oversight

Andrew Sliger
Dept. of Biological Sciences
Univ. of Tennessee, Martin
Martin, TN 38238

Chair, Industry and Government

David J. Wilson
Brown and Caldwell
501 Great Circle Road
Nashville, TN 37228

Chair, Long Range Planning

George Murphy
Dept. of Biology, Box 60
Middle Tennessee State Univ.
Murfreesboro, TN 37132

Chair, Publicity

Mandy Carter Lowe
Math and Science Dept.
Columbia State Comm. College
Columbia, TN 38402-1315

2001-2003 Member-at-large

Steven M. Wright
Dept. of Biology, Box 60
Middle Tennessee State Univ.
Murfreesboro, TN 37132

2002-2004 Member-at-large

Stewart Elston
Dept. of Physics
Univ. of Tennessee, Knoxville
Knoxville, TN 37996-1200

2003-2005 Member-at-large

The TENNESSEE ACADEMY OF SCIENCE was founded in 1912 at Nashville, Tennessee. Membership is open to all teachers and professors of science, research workers in science both in educational institutions and industrial establishments, and all others who are interested in some phase of science. Annual dues are \$20 for members and fellows, except students and emeritus members whose dues are \$10. Life membership is \$200. Applications for membership should be addressed to the Treasurer.

Affiliated societies of the Academy are: American Association for the Advancement of Science (AAAS); Barnard Astronomical Society, Clarence T. Jones Memorial Observatory, Chattanooga; Barnard-Seyfert Astronomical Society, Nashville; National Association of Academies of Science; Tennessee Association of Science Department Chairs; Tennessee Junior Science and Humanities Symposium; Tennessee Entomological Society; Tennessee Ornithological Society, Nashville; Tennessee Psychological Association; and Tennessee Science Teachers' Association.

The JOURNAL OF THE TENNESSEE ACADEMY OF SCIENCE (ISSN 0040313X) is published by the Tennessee Academy of Science, Department of Biology, Tennessee Technological University, 900 N. Dixie Avenue, Cookeville, TN 38505, for all members not in arrears for dues. The subscription rate is \$20 per year. Single copies of recent issues are \$10. Whole sets of back issues on microfilm are available from AMS Press, Inc., 56 E. 13th Street, New York, NY 10003. Postage paid at: Cookeville, TN, and at additional mailing offices. Send address changes to: JOURNAL OF THE TENNESSEE ACADEMY OF SCIENCE, % DR. JOHN W. HARRIS, DEPARTMENT OF BIOLOGY, TENNESSEE TECHNOLOGICAL UNIVERSITY, P.O. BOX 5063, COOKEVILLE, TN 38505.

This Journal is abstracted by Biological Abstracts, Chemical Abstracts, and Nuclear Abstracts, and is indexed by Science Citation Index and Agricola Citations.