

*Pennsylvania Academy of Science*

**LAST CALL FOR ABSTRACTS**

Pennsylvania Academy of Science  
**78<sup>th</sup> ANNUAL MEETING**

Pocono Manor  
Pocono Manor, PA

**April 5 - 7, 2002**

**DEADLINE FOR RECEIPT OF ABSTRACTS:  
15 DECEMBER 2001**

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*The Pennsylvania Academy of Science Newsletter*

Jane E. Huffman, Editor

East Stroudsburg University, East Stroudsburg, PA 18301

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**FROM THE DESK OF THE PRESIDENT**

Our lives have changed as a result of the tragedies of September 11, and I know I speak for all of the members of PAS in expressing our condolences to all of you who have experienced the loss of a loved one in the terrible events that occurred that day. As the events have unfolded in subsequent days, we remain stunned at the magnitude of the repercussions of this attack. As citizens and scientists of the

state of Pennsylvania, we are ready to help in any way we can to assist in the recovery process, knowing that it will be a long and heartbreaking task.

We are of course proceeding with our work of the Academy, as usual, with the major focus now being our annual meeting on April 5 through 7 at the Pocono Manor Inn and Golf Resort in Pocono Manor, PA. We expect a big turnout of papers, and especially encourage oral presentations, if possible. We are trying something new this year for our evening activities, starting on Friday with an outstanding presentation by Dr. Ned D. Heindel, Bunn Professor of Chemistry at Lehigh University and former president of the American Chemical Society. Then on Saturday night, we will have a mixer/dance, which will give everyone a chance to network and mingle informally, and also have a good time!

We look forward to an informative and eventful meeting this Spring, and remember to get your abstracts in early!

**Address Change and Membership Applications:**

**Valerie G. Kalter**, Membership Chairperson, Biology Department,  
Wilkes University, Wilkes-Barre, PA 18766. (570) 408-4725;  
e-mail: [vkalter@wilkes.edu](mailto:vkalter@wilkes.edu)

## CALL FOR NOMINATIONS

Nominations are solicited for the following officers whose terms expire in April 2002. Their major duties are described below:

**President-Elect (2 year term):** Serves on committees and undertakes other assignments at the direction of the President; serves with the President and committees in organizing the Annual Meeting; attends the State meeting of the PJAS; presides at meetings in the absence of the President.

**Treasurer-Elect:** Assists the Treasurer in a variety of activities in preparation for serving as Treasurer if and when elected to that position; collects housing and registration deposits for the PAS Annual Meeting; serves as a standing member of the Finance and Investment committees of the Academy.

**Historian (4 year term):** Collects all data and records of significance to the Academy; acts as Academy archivist in conjunction with the State Museum of the PA; serves as chairperson of the Resolutions Committee.

In addition, two (2) Directors-at-large positions (staggered 2 year terms) as defined in Article III, Section 1 of the PAS Constitution are to be filled and selected from chairs and standing committees as defined in Article VI, Section 4 of the PAS Constitution.

**Director-at-large #1 (2 year term [2002-2004])**

**Director-at-large #2 (2 year term [2002-2004])**

Submit all nominations to:

Dr. Assad Panah  
 Immediate Past President and  
 Chairman of the Nomination Committee  
 Professor and Director  
 Department of Geology and Environmental Science  
 University of Pittsburgh at Bradford  
 300 Campus Drive  
 Bradford, PA 16701  
 E-mail: [aap@pitt.edu](mailto:aap@pitt.edu)  
 Phone: 814-362-7569  
 Fax: 814-362-5088

## YOUR NEWS SOLICITED

*Please don't hesitate to submit to the editor items that you feel might be of interest to PAS members. This can include publications, honors, and awards by you or colleagues; upcoming events; job, grant, and scholarship information.*

In addition, please feel free to send your comments and suggestions to the editor regarding the content of the Newsletter.

Submission by e-mail is preferred, but submissions through the mail are also welcome.

## SASA FOR PAS MEMBERS

*State Academies of Science Abstracts (SASA) is again being made available for free use by all members of the Pennsylvania Academy of Science. SASA includes all science disciplines, all Academies of Science of the U.S. (except NY Acad. Sci.), and far more years of coverage than any other electronic database. The Journal of the Pennsylvania Academy of Science is covered for the years 1946- present.*

To access SASA and conduct a search go to:

<http://acadsci.marshall.edu:8765>

User name: acadsci

Password: fallabstracts

Domain (if called for)- muacadsci

*We regret that free use of SASA can be offered only to members of your academy of science. If non-members want access they should be encouraged to contact their science librarians about subscribing to SASA (<http://www.acadsci.com>). A production database accessible by IP address is reserved for subscribers.*

It is hoped that SASA will be used in your research and that academy of science papers will be cited in any manuscript that is prepared. If you have questions concerning conducting a search, etc., please feel free to contact a representative of AcadSci, Inc.

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Email: [acadsci@ntsource.com](mailto:acadsci@ntsource.com)

Web site: <http://www.acadsci.com>

## BRING YOUR SPOUSE TO THE ANNUAL MEETING

The 78<sup>th</sup> Annual Meeting of the PAS will be held 5-7 April 2002 at the Pocono Manor, Pocono Manor, PA. As always, you are encouraged to bring your spouse to this meeting. There are numerous activities and amenities available, including an indoor pool and sauna, horseback riding, indoor and outdoor tennis, and two 18-hole golf courses. The resort is located in the Pocono Mountains, an area of great natural beauty. Also nearby is "The Crossings", a large factory outlet center. The total cost to bring your spouse to the meeting is \$180, which includes two nights lodging, five meals, and complimentary greens fees.

## MANUSCRIPTS SOLICITED FOR THE PENNSYLVANIA GEOGRAPHER

The editors of *The Pennsylvania Geographer*, a peer reviewed, semi-annual journal of the Pennsylvania Geographical Society, are soliciting manuscripts for the **Spring/Summer 2002** edition. The journal is in its 40<sup>th</sup> consecutive year of publication. The general topic for this edition of the journal is: **URBAN GEOGRAPHY AND PLANNING**. Papers dealing with the above theme, or any other geographical topics, will be considered for publication. Please send manuscripts and/or inquiries to Dr. William B. Kory, Editor, or Dr. Gregory Faiers, Associate Editor, *The Pennsylvania Geographer*, Geography Department, University of Pittsburgh at Johnstown, Johnstown, PA 15904. Phone: (814) 269-2994; 2993 or 2990. E-mail: [koryupj@pitt.edu](mailto:koryupj@pitt.edu)

<u>Issue</u>	<u>Featured Topic</u>	<u>Submission Deadline</u>
Spring/ Summer 2002	Urban Geography & Planning	15 Feb 2002
Fall/ Winter 2002	Geography and the Environment	15 Aug 2002

**NOTE:** The Spring/Summer 2003 issue of *The Pennsylvania Geographer* will be dedicated to the commemoration of the 50<sup>th</sup> anniversary of the Pennsylvania Geographical Society. Any and all material dealing with the topic will be considered for publication. Contact the editor or Professor Robert Ziegenfus, Kutztown University (Ph: 610-683-4364) for additional information.

Visit us on the web at [www.pitt.edu/~pageog/](http://www.pitt.edu/~pageog/)

### RECENT PUBLICATION BY MEMBERS

**Fried, B., Reddy, A. and Balfour, C.D.** (2001). Excystation and distribution of metacercariae of *Echinostoma caproni* in ICR mice. *Comparative Parasitology* 68: 259-261.

**Mullican, S.K., Huffman, J. E. and Fried, B.** (2001) Infectivity and comparative pathology of *Echinostoma caproni*, *Echinostoma revolutum* and *Echinostoma trivolvis* (Trematoda) in the domestic chick. *Comparative Parasitology* 68: 256-259.

### UPCOMING MEETINGS

<u>EVENT</u>	<u>LOCATION</u>	<u>DATES</u>
<b>PAS 79<sup>th</sup> Annual Meeting</b>	Holiday Inn, Harrisburg/Hershey, Granville, PA.	April 4-6 2003
<b>National Council Undergraduate Research (NCUR)</b>	University of Wisconsin at Whitewater	April 25-27 2002
<b>National Council Undergraduate Research (NCUR)</b>	University of Utah Salt Lake City, Utah	March 12-15 2003

## BOOK REVIEW

### ***IRON, NATURE'S UNIVERSAL ELEMENT: WHY PEOPLE NEED IRON AND ANIMALS MAKE MAGNETS***

By Eugenie V. Mielczarek and Sharon B. McGrayne  
Rutgers University Press, New Brunswick, New Jersey and  
London, 2000, XVI & 205 pages,  
Glossary and Bibliographic Index

The theme of this book dwells on the development of early life and the dependence of living organisms, from simple bacteria to the higher forms of life, on the abundance of iron. The book is divided into eight chapters: the development of an iron dominant earth and the origin of anaerobic life, the formation of oxygen in the atmosphere through photosynthesis, molecules that enable living organisms to adapt, to tolerate, and form a synergistic relationship with atmospheric oxygen, the use of hemoglobin and myoglobin by large organisms and genetic diseases (i.e., sickle cell anemia and hemochromatosis), the role of iron magnetic compasses in the migration of animals (i.e., birds, pigeons and fish), the effect of iron in the earth's oceans in developing food sources for a growing human population, and the deleterious effects of low-iron diets in the human population of poor countries. The reader will appreciate the nontechnical format and the lack of scientific detail. Besides the glossary, another valuable aid is the alphabetically arranged bibliography by chapter consisting of relevant articles for pursuing one's interests.

Dr. Howard S. Pitkow  
Professor Emeritus of Physiology  
Temple University School of Medicine  
Philadelphia, Pennsylvania.

### ***The Editor Recommends....***

**Human Trials: Scientists, Investors, and Patients in the Quest for a Cure**  
By Susan Quinn, Perseus Publishing, 2001

### ***More Good Reading...***

**The Billion-Dollar Molecule: One Company's Quest for the Perfect Drug**  
By Berry Werth, Touchstone Books, 1995

**The Powerful Placebo: From Ancient Priest to Modern Physician**  
By Arthur Shapiro and Elaine Shapiro, Johns Hopkins University Press, 2001

**Fundamentals of Clinical Trials**  
By Lawrence M. Friedman, Curt Furberg and David L. Demets  
Springer-Verlag, 1998

**Beyond Consent: Seeking Justice in Research**  
By Jeffrey P. Kahn, Anna C. Mastroianni and Jeremy Sugarman  
Oxford University Press, 1998

**The Investigator's Guide to Clinical Research**  
By David Ginsberg, CenterWatch, 1999

### ***PAS Books in Preparation:***

**Renewable Energy: Trends and Prospects**  
S.K. Majumdar, E. Willard Miller and A.I. Panah – Editors  
Expected Publication date: March/April 2002

## PENNSYLVANIA SCIENTISTS

*Clarence J. Murphy*

*This is the fifth in a series of articles describing the careers and accomplishments of scientists who were born or worked in Pennsylvania*

### Theodore W. Richards (1868-1928)

Theodore William Richards was born on January 31, 1868 in Germantown, PA, the son of a marine painter. He was educated at home by his mother until he entered Haverford College in 1882 at the age of fourteen, where he concentrated his studies in astronomy and chemistry. Poor eyesight and the instruction of Lyman B. Hall, a former student of Friedrich Wöhler at Göttingen and assistant to Ira Remsen at Johns Hopkins, led him to specialize in chemistry.

Following his graduation from Haverford in 1886 he became a student of Josiah Parsons Cooke at Harvard where he was awarded the doctorate in 1888. Under Cooke Richards made a study of the ratio of oxygen to hydrogen in water by passing a carefully weighed quantity of hydrogen over cupric oxide and weighing the quantity of water formed. By this experiment he demonstrated that the accepted atomic weight of hydrogen was too high and that of copper was too low.

The excellence of his graduate work led to a traveling fellowship during which he spent a year in Germany studying analytical chemistry with Victor Meyer and visiting various important laboratories. At the end of the fellowship he returned to Harvard to teach analytical chemistry and do research on atomic weights. On the death of Cooke in 1894 Richards was awarded a leave of absence to study physical chemistry with Wilhelm Ostwald in Leipzig and Walther Nernst in Göttingen. He brought back from Germany the latest ideas on the properties of solutions and taught physical chemistry for the remainder of his career.

His research was concentrated in the careful determinations of atomic weights and his knowledge of physical chemistry allowed him to point out the errors made by his predecessors and to make the proper corrections. The excellence of his work led to the offer in 1901 of a professorship at Göttingen, which he declined.

In all, he and his students determined the atomic weights of 28 elements to unprecedented accuracy. His painstaking attention to detail made him the foremost authority in the field. He was awarded the Nobel Prize in Chemistry in 1914; the first American to be so honored.

Richards built Harvard into the foremost institution of graduate instruction in chemistry in the United States. In his teaching he placed great emphasis on the understanding of principles and in the historical development of these principles. His ability as a teacher and his influence on the development of physical

chemistry is reflected in the number of his students who achieved prominence in the next generation. Among them were A. B. Lamb and James Conant of Harvard, H. H. Willard of Michigan, J. H. Mathews and Farrington Daniels at Wisconsin, and G. N. Lewis at the California Institute of Technology.

Richards married Miriam Thayer, daughter of a Harvard Divinity School professor, in 1896. One of his sons, William, became professor of chemistry at Princeton and his daughter, Grace, became the wife of his student James B. Conant who became professor of chemistry and later president of Harvard University. He died on April 2, 1928, one of America's most honored scientists.

## LEARNED DISCOURSES

### Timely Scientific Opinions

#### *Intent.*

The intent of **Learned Discourses** is to provide a forum for open discussion by and for PAS members. These articles will reflect the professional opinions of the authors regarding scientific issues. They will not represent PAS positions or policies. And, although they are subject to editorial review for clarity, consistency, and brevity, these articles will not be peer reviewed. The success of the **Learned Discourses** depends on our contributors. We encourage submissions that are timely and will inform and stimulate discussion. If you disagree with an opinion expressed here, *submit a reply*.

#### *Rules.*

All submissions must be succinct: no longer than 1,000 words, no more than 6 references, and at most one table or figure. Reference format must follow that of the Journal of the Pennsylvania Academy of Science. Topics may fall within any area of science.

#### *Submissions.*

Send submissions as e-mail attachments (Word), to Jane E. Huffman ([jhuffman@po-box.esu.edu](mailto:jhuffman@po-box.esu.edu)). Submissions will be printed on a first-received basis when space limitations apply.

#### *Learned Discourses Editor*

Jane E. Huffman  
Department of Biological Sciences  
Fish & Wildlife Microbiology Laboratory  
East Stroudsburg University  
East Stroudsburg, PA 18301

# CALL FOR ABSTRACTS

## 78<sup>th</sup> Annual Meeting of the Pennsylvania Academy of Science

### Pocono Manor, Pocono Manor, PA

### April 5 – 7, 2002

**DEADLINE FOR RECEIPT OF ABSTRACTS: 15 December 2001**

## INSTRUCTIONS FOR PREPARING AND SUBMITTING ABSTRACTS

*Read All Instructions Before Writing Abstract*

### Rules Governing Submission and Acceptance of Abstracts

1. The corresponding author must be a member of PAS in order to submit an abstract.
2. One person cannot be listed as the presenter on more than **three** abstracts.
3. Once an abstract has been accepted by the Program Committee, it cannot be withdrawn.
4. The abstracts will be published in a supplemental issue of the *Journal of the Pennsylvania Academy of Science* to be distributed at the annual meeting.
5. Any abstracts received after December 15, 2001 will not be published.
6. Authors will be notified when the abstract is received and again in February concerning the acceptability and presentation time of the abstract.
7. A \$10 abstract fee is charged for each abstract submitted.

### Preparation of Abstracts

1. The abstract should contain a statement of the problem being investigated, the methods used, the important results, and a conclusion.
2. The abstract cannot be longer than 150 words. It should be typed double-spaced, and four copies of the abstract should be submitted along with the standard abstract form.
3. The format will be title, authors' names, addresses, and abstract. The title should be concise. Place an asterisk after the name of the author presenting the paper. Each author's address should include the institution, city, and state. All addresses should follow the last author's name.
4. Improperly prepared abstracts will be rejected.

### Submission by mail

1. Submit four copies of the abstract prepared as described above, including title, authors' names and addresses, and presenter indicated by asterisk.
2. Complete and submit four copies of the "Standard Abstract Form" together with the abstract. Choose either oral or poster presentation. Also indicate the preferred subject category.
3. Enclose two stamped, self-addressed postcards for each abstract. Write the abstract title on the back of each card. They are used to send you receipt-of-abstract and session notifications.
4. Include a check, payable to PAS, to cover the fee of \$10.00 for each abstract submitted.

5. All the materials must be received by December 15, 2001.
6. Mail Abstracts, standard abstract forms, 2 self-addressed postcards and checks covering abstract submission fees to:  
Dr. Tim Maret  
Department of Biology  
Shippensburg University  
Shippensburg, PA 17257

### Electronic Submission of Abstracts

This feature is temporarily unavailable.

### Presentation of Paper or Poster; Projection Facilities

1. Oral presentations are normally limited to fifteen minutes per paper. Speakers should prepare a clear and precise presentation.
2. Papers can also be presented at a poster session. Indicate this preference on the Standard Abstract Form. Allotted poster space is 4' x 4'. If additional space is needed, please indicate this on your abstract from (8' x 8' maximum). Space for oversize posters is limited.
3. Projectors for 2" x 2" (35mm) slides and overhead transparencies will be available in each room. Other facilities must be arranged by the speaker in advance of the meeting. Computers and LCD projection plates are the responsibility of the speaker. Contact Dr. Kenneth Thomulka. Phone: (215) 596-8710 or e-mail: [k.thomul@usip.edu](mailto:k.thomul@usip.edu)
4. The number of poster presentations has climbed in recent years, while the number of oral presentations has dropped. This has caused some scheduling problems at recent meetings. We particularly encourage faculty and graduate students to consider giving an oral presentation.

### Abstract Submission Fee

The abstract submission fee of \$10 per abstract should be made payable to the Pennsylvania Academy of Science and sent to Dr. Tim Maret at the above address.

### Acknowledgment of Receipts and Abstracts

Abstracts submitted by mail will be acknowledged by the self-addressed postcards submitted with your abstract. If you do not receive acknowledgment within two weeks of submission, please contact Dr. Maret at the address listed above. Ph: (717) 477 1170. E-mail: [tjmare@ship.edu](mailto:tjmare@ship.edu)

**STANDARD ABSTRACT FORM**

Provide Information for CORRESPONDING AUTHOR (PAS member)

<b>Last Name</b>	<b>First Name</b>	<b>M.I.</b>
<b>Position</b>	<b>Area Code</b>	<b>Phone Number</b>
<b>Organization</b>	<b>E-mail Address</b>	
<b>Street Address or P.O. Box</b>		
<b>City</b>	<b>State</b>	<b>Zip Code</b>

Date: \_\_\_\_\_ Author's Signature: \_\_\_\_\_

Type of Presentation Desired: \_\_\_\_\_ Oral \_\_\_\_\_ Poster (4' x 4') \_\_\_\_\_ Poster Size: \_\_\_\_\_

**Facilities:** A slide projector, an overhead projector, and a wooden pointer will be provided in each meeting room. Other facilities must be arranged for by the speaker in advance of the meeting and coordinated with the Local Arrangements Chairperson, Dr. Kenneth Thomulka (215) 596-8923 or e-mail: [k.thomul@usip.edu](mailto:k.thomul@usip.edu) and Deborah Ricker (717) 846-7788 extn:1510 or e-mail: [dricke@ycp.edu](mailto:dricke@ycp.edu)

Note any scheduling constraints here: \_\_\_\_\_

Select a **subject category** (indicate by check mark):

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Botany                | <input type="checkbox"/> Behavior                        | <input type="checkbox"/> Medicine  |
| <input type="checkbox"/> Zoology               | <input type="checkbox"/> Genetics                        | <input type="checkbox"/> Education   |
| <input type="checkbox"/> Mammology             | <input type="checkbox"/> Molecular/Cell Biology          | <input type="checkbox"/> Physical Sciences/Math/<br>Computer Science/Engineering |
| <input type="checkbox"/> Wildlife Biology      | <input type="checkbox"/> Microbiology/Immunology         | <input type="checkbox"/> Geology   |
| <input type="checkbox"/> Ecology               | <input type="checkbox"/> Parasitology                    | <input type="checkbox"/> Geography   |
| <input type="checkbox"/> Aquatic Biology       | <input type="checkbox"/> Biochemistry/Chemistry          |  |
| <input type="checkbox"/> Environmental Science | <input type="checkbox"/> Toxicology                      |  |
| <input type="checkbox"/> Physiology            | <input type="checkbox"/> Meteorology/Atmospheric Science | <input type="checkbox"/> Other: _____  |

Check if interested in being a session chairperson. Subject: \_\_\_\_\_

Abstract Title: \_\_\_\_\_  
 \_\_\_\_\_

Authors (put asterisk after name of person presenting paper): \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Submit text of the Abstract on a separate sheet (150 words or less; see instructions on facing page).

There is an Abstract Submission Fee of \$10 per abstract. Please make check payable to: Pennsylvania Academy of Science.

Submit four copies of this form and the abstract, two self-addressed postcards with the abstract title written on the back, and the check to: **Dr. Tim Maret, Department of Biology, Shippensburg University, Shippensburg, PA 17257.**

There will be a separate conference registration form and fee. Details and forms will appear in the January & February Newsletters.

# SCHEDULE OF ACTIVITES AT A GLANCE

**78<sup>th</sup> Annual Meeting of the Pennsylvania Academy of Science**  
 April 5-7, 2002, Pocono Manor Inn & Golf Resort, Pocono Manor, PA

## *FRIDAY, APRIL 5*

		<b>Room</b>
1:00 PM	Board of Director's Meeting .....	Friendship Room
3:00 – 8:00 PM	Registration .....	Lobby
6:30 – 8:00 PM	Dinner .....	Dining Room
8:15 PM	Speaker.....	Horizon Lounge

## *SATURDAY, APRIL 6*

7:30 – 9:00 AM	Breakfast .....	Dining Room
8:30 – 11:00 AM	Registration .....	Lobby
9:00 AM – 5:00 PM	Exhibits .....	Horizon
9:00 AM – 12:00 NOON	Paper Presentations .....	Friendship Room Sam's Place William Penn Independence Room
8:30 – 10:00 AM	Poster Session I .....	Horizon Lounge
10:00 AM	Coffee Break .....	Fountain Room
10:30 AM – 12:00 NOON	Poster Session II .....	Horizon Lounge
12:00 NOON – 1:00 PM	Lunch .....	Dining Room
1:00 – 4:15 PM	Paper Presentations.....	Friendship Room Sam's Place William Penn Independence Room
1:00 – 2:30 PM	Poster Session III .....	Horizon Lounge
2:30 PM	Coffee Break .....	Fountain Room
3:00 – 3:40 PM	Poster Session IV .....	Horizon Lounge
4:15 PM	Business Meeting .....	William Penn
5:00 – 6:30 PM	Social Hour (Cash Bar) .....	Old Lamplighter Lounge
6:30 – 8:00 PM	Dinner .....	Dining Room
8:15 PM	Speaker.....	Horizon Room

## *SUNDAY, APRIL 7*

7:30 – 9:00 AM	Breakfast .....	Dining Room
8:30 – 10:00 AM	Registration .....	Lobby
10:00 AM	Coffee Break.....	Fountain Room
8:30 – 11:00 AM	Paper Presentations .....	Friendship Room Sam's Place William Penn Independent Room
9:00 – 10:30 AM	Poster Session V .....	Horizon Lounge
11:00 AM	Board of Director's Meeting .....	William Penn

## ***POSTER INSTRUCTIONS***

### **SIZE**

Poster boards are four feet high x four feet wide.

### **REQUIREMENTS**

- The abstract number assigned to the poster will be placed in the upper left-hand corner of the display. Be sure to include the abstract title, author names, and the institution where the work was completed in large letters centered at the top of the poster.
- At least one of the authors must be at the assigned space during the designated time to discuss the work presented.

### **TIPS FOR POSTER PREPARATION**

- Posters should stimulate discussion, not give long presentations. Therefore, keep text to a minimum, emphasize graphics, and make sure every item in your poster is necessary.
- Utilize handouts to supplement posters.
- Materials must be easily read at a distance of four feet. As a rule of thumb, use a font size of at least 14 point and double space.
- Place related materials (e.g. photo with accompanying text) close together, and then highlight it by framing with blank space.
- Space your information proportionally. Divide poster either horizontally or vertically into three or four sections, and place materials within those spaces.
- When choosing a background, remember that neutral or gray colors will be easier on the eyes than a bright color.

Paper #

**ABSTRACT TITLE**

***AUTHORS & AFFILIATIONS***

Abstract	Graph	Results	Photo	Discussion
Abstract	Method	Results	Chart	Conclusions

**PENNSYLVANIA ASSOCIATION OF ENVIRONMENTAL  
PROFESSIONALS**

**CALL FOR POSTERS/SPEAKERS**

2002 ANNUAL MEETING

**Spring 2002 Southeastern PA**

The PAEP invites all interested parties to submit applications for either a speaking session or a poster display at the PAEP Annual Meeting in the SE Pennsylvania area in March or April 2002.

**Session Track One  
Social and Economic Issues**

- Environmental Justice
- Secondary and Cumulative Impacts
- Community Impact Assessments
- Panel Discussion: Impact Evaluations

**Session Track Two  
NEPA and Cultural Resource  
Issues**

- Section 106 – Consulting Parties
- Evaluating Section 4(f) Resources
- Public Participation and Outreach
- Panel Discussion: Expediting Cultural Resource Evaluations/ Reviews

**Session Track Three  
Natural Resources**

- Stream Mitigation Options
- Terrestrial Mitigation Options

- Wetland Mitigation Options
- Panel Discussion: How do we mitigate for project impacts.

**About the Poster Session**

A Poster Session will be considered during our breaks and receptions. If interested, please submit your information. Stations will be designated with a table and a 4' x 8' vertical poster board.

Electrical connection will be available at each station. Telephone connection will not be available.

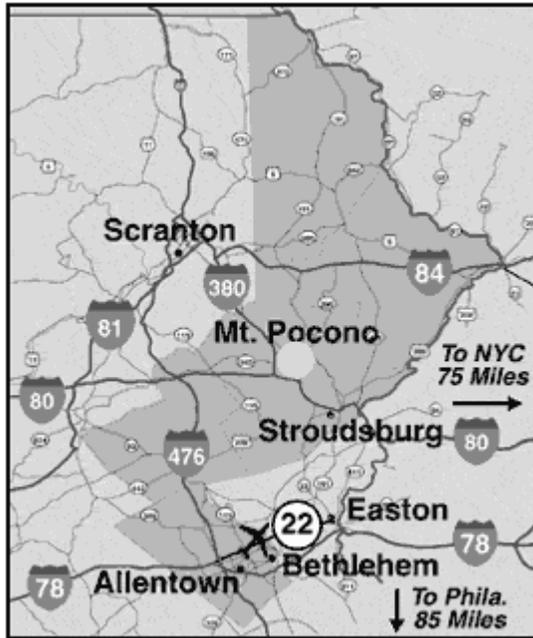
**APPLICATION DEADLINE: DECEMBER 21, 2001**

**For further information and to return applications, please contact:**

Katherine M. Farrow, Associate  
Orth-Rodgers & Associates  
301 Lindenwood Drive, Suite 130  
Malvern, PA 19355  
Voice: 610-407-9700  
Fax: 610-407-9600  
E-mail: [kfarrow@orth-rodgers.com](mailto:kfarrow@orth-rodgers.com)



# Directions to Pocono Manor Inn & Golf Resort



**From New York City and Points East**  
 Interstate 80 West from the George Washington Bridge to I-380 North. At first exit (Pocono Exit 3), turn right and follow signs to the Manor.

**From Philadelphia and Points South**  
 I-95 North to the Northeast Extension of the PA Turnpike (I-476). North on Turnpike to Pocono Exit 35 to I-80 East to I-380 North. At the first exit (Pocono Exit 3), East on Route 940 and follow signs to the Manor.

**From Points West**  
 PA Turnpike to Harrisburg, PA, I-81 North to I-80 East to I-380 North. At the first exit (Pocono Exit 3), East on Route 940 and follow signs to the Manor.

**From Points North**  
 I-81 South to I-380 South to Pocono Exit 3. East on Route 940, follow the signs to the Manor.

**From Points Northeast**  
 Route 84 West to Route 380 South to Pocono Exit 3. East on Route 940 and follow signs to the Manor.

**From Lehigh Valley International Airport**  
 Route 22 West to PA Turnpike (I-476). North on Turnpike to Pocono Exit 35 to I-80 East to I-380 North. At the first exit (Pocono Exit 3), East on Route 940 and follow signs to the Manor.

# 78<sup>th</sup> Annual Meeting, Pennsylvania Academy of Science -HOUSING RESERVATION AND REGISTRATION INFORMATION-

The total cost of the housing and meal package will be \$180.00 per person, double occupancy, if paid by February 28, and \$190.00 after February 28. No reservations will be accepted after February 28, 2002. This price includes two nights lodging (Friday and Saturday) in a double room, five meals (Friday dinner; Saturday breakfast, lunch and dinner; Sunday breakfast), and coffee breaks. The package is available only to those who stay two nights and **make reservations through the PAS.**

In addition, the Meeting Registration Fee is: \$30 for members and affiliates if paid in advance or \$40 if paid at the meeting; \$40 for non-members if paid in advance or \$50 if paid at the meeting; \$15 for students. The One-Day Registration Fee

is \$20 for members and affiliates in advance or \$25 at the meeting; \$40 for non-members in advance or \$50 at the meeting; \$10 for students.

Because we must know in advance the number of rooms to be reserved by the Academy, all reservations must be received by February 28, 2002. Refunds of payments will be given if requested in writing by February 28, 2002.

All rooms will be double occupancy. We recommend that you list two names on the reservation form below. Otherwise PAS will assign a roommate for you.

Limited number of single rooms available at \$265.00.

## HOUSING RESERVATION FORM

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Male:  Female:  Phone: ( ) \_\_\_\_\_

Employer/Affiliation (for badge) \_\_\_\_\_

- PAS Member .....
- Student .....
- Exhibitor .....
- Spouse .....
- Smoking  Non-Smoking

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Male:  Female:  Phone: ( ) \_\_\_\_\_

Employer/Affiliation (for badge) \_\_\_\_\_

- PAS Member .....
- Student .....
- Exhibitor .....
- Spouse .....
- Smoking  Non-Smoking

### Total Housing /Meal Package Payment Due:

Number of adults \_\_\_\_\_ @ \$180.00 per person if paid by February 28 = \_\_\_\_\_

Number of adults \_\_\_\_\_ @ \$190.00 per person if paid after February 28 = \_\_\_\_\_

Children age 5 and under in parents' room .....FREE

Children age 6-12 in parents' room \$40 2 Day Meal Package

Children age 13+ in parents' room \$80 2 Day Meal Package

Single room \_\_\_\_\_ \$ 265.00

## MEETING REGISTRATION FORM

### FULL MEETING REGISTRATION:

No. of members or Affiliates \_\_\_\_\_ @ \$30 = \_\_\_\_\_

No. of Non-Members \_\_\_\_\_ @ \$40 = \_\_\_\_\_

No. of Students \_\_\_\_\_ @ \$15 = \_\_\_\_\_

### ONE-DAY MEETING REGISTRATION:

No. of members or Affiliates \_\_\_\_\_ @ \$20 = \_\_\_\_\_

No. of Non-Members \_\_\_\_\_ @ \$40 = \_\_\_\_\_

No. of Students \_\_\_\_\_ @ \$10 = \_\_\_\_\_

Make checks payable to: *Pennsylvania Academy of Science*  
Send completed forms and payment to: Dr. Deborah D. Ricker  
Department of Biological Sciences, York College of PA, York  
PA 17405-7199.  
A receipt will be mailed to you.

<b>TOTAL DUE</b> (housing & registration): _____
Amount Enclosed: _____
Balance Due: _____

**SCHOLARSHIP & AWARD OPPORTUNITIES**  
**Spencer Foundation Major Research Grants Program**

The grants program is intended for research projects requiring more than \$35,000 in grant support. Awards of up to \$35,000 are made. Inquiries and preliminary proposals are accepted at any time. The principal investigator must have an earned doctorate in an academic discipline or a professional field and must be affiliated with a college, university, research facility, or cultural institution. The foundation supports research that promises to contribute new knowledge to the improvement of education, broadly conceived, in the U.S. and abroad. A variety of disciplinary and interdisciplinary approaches are favored, though emphasis is given by charter to the behavioral sciences. The foundation is interested as well in the related research areas of cultural knowledge, socialization, and the production and distribution of knowledge. Research may range from medium-sized studies that can be completed in a year by an individual researcher to more extensive collaborative studies that last several years. Grants are not made to maintain organizations or infrastructures of educational research. Additional information can be found on the Web at <http://www.spencer.org/proginfo.htm>. For further information, contact: John B. Williams, Vice-President, Spencer Foundation, 900 North Michigan Avenue, Suite 2800, Chicago, IL 60611-1542.

**PENNSYLVANIA EVOLUTION**  
**LISTSERV ESTABLISHED**

EVOLISTPA-L ("Evolution List of Pennsylvania") is a discussion and support group designed to assist biologists and biology teachers in promoting the teaching of evolution and preventing the teaching of creationism in science courses of the public school system of Pennsylvania. Organized by the American Institute for Biological Sciences (<http://www.aibs.org>) and its member societies, this list-serve is one of fifty, each of which represents one state of the U.S. As a bulletin board for information from the bottom-up (grassroots) and top-down (national organizations), EVOLISTPA-L and its associated network of list-serves is intended to:

- (1) serve as a support network for teachers who are on the front line in teaching evolution
- (2) help educators communicate the theory of evolution to students that may have existential conflicts between scientific reality and religious belief systems
- (3) keep users abreast of evolution-related curriculum policies up for adoption by local school boards, state legislatures, etc.
- (4) alert people as to the need for public support of evolution education (letters to the editor, letters to legislators, & attendance at public hearings), and
- (5) act as a forum for discussion on evolution education issues in the state of Pennsylvania.

To subscribe to the Pennsylvania Evolution List, send an email message  
 subscribe EVOLISTPA-L your name  
 to: [listproc@lehigh.edu](mailto:listproc@lehigh.edu)

Leave the subject line blank. Also, make sure that you disable any automatic signature lines that you include in your emails.

If you are successful in signing on, you will receive an automated welcoming message containing information about the list.

**DARBAKER PRIZE COMPETITION**

The Darbaker Prize is given by the Pennsylvania Academy of Science (PAS) for outstanding scholarly contributions which use microscopic techniques and present microscopic illustrations in the reporting of biological research. The prize is competitive among qualified papers accepted for publication in the PAS Journal in association with the annual meeting of the PAS. The PAS established the Darbaker Prize in 1952. Funds for the prize were made available through a bequest of the late Leisure K. Darbaker, 1939 PAS President.

To qualify for the Darbaker Prize, competition entrants must: (1) have used microscopy (light, SEM, TEM, or other technologies) in the research they report, (2) submit to the PAS Journal for publication consideration, in proper format, a manuscript reporting the results of the completed study, (3) specifically state a request that the Editor of the Journal enter the manuscript in the Darbaker Prize competition, and (4) be members of the PAS at the time of manuscript submission. Darbaker Prize competition manuscripts are expected to be presented and submitted at the annual meeting of the PAS, but, if not, will be accepted for consideration within four weeks (28 calendar days) following the last day of the annual meeting. Only manuscripts that successfully complete the review process and are accepted for publication in the Journal will be eligible for the prize.

The Editor of the Journal will examine all manuscripts submitted for prize competition and determine if all requirements have been met. The Editor will then forward all eligible manuscripts, together with the Editor's and reviewers' suggestions and recommendations, to the PAS President for a final decision. The Darbaker Prize recipient or recipients will be informed of their selection by the President of the Academy. Formal public announcement of the Darbaker Prize will be made in a subsequent issue of the Journal. The value of the prize will be at least equal to the page charges required to print the article in the Journal and may or may not include an additional monetary amount.

For further information, contact  
 Prof. Shyamal K. Majumdar, Ph.D.,  
 Editor of the Journal  
 Department of Biology  
 Lafayette College, Easton, PA 18042.  
 Phone: (610) 250-5464  
 Fax: (610) 250-6557

**PENNSYLVANIA BIODIVERSITY PARTNERSHIP  
PA BIODIVERSITY METADATA FORM**

**To all Biodiversity Experts and Stakeholders**

**Request for Information on Pennsylvania  
Biodiversity Datasets**

The Pennsylvania Biodiversity Partnership (PBP), a public-private partnership, formed to advance biodiversity issues in Pennsylvania is presently preparing a report on the current state of biodiversity in Pennsylvania as the first step in developing a statewide biodiversity conservation plan. As part of this "state of the state" effort, we are compiling a directory of databases in Pennsylvania dealing with biodiversity and are requesting your help in this effort.

If you have one or more specimen-based or ecological datasets of Pennsylvania biota in any format (electronic or hard copy), please go to <http://www.upb.pitt.edu/ainh/metadata/index.htm> and fill out and submit a metadata form. The form can be accessed by clicking on "Biodiversity Metadata Form". PLEASE NOTE, we are NOT asking for access to your datasets. We are requesting a DESCRIPTION ONLY of your existing datasets.

In so far as possible, we have developed a biodiversity metadata form in keeping with national standards for the collection of biological metadata. The form has been tailored specifically to the needs of PBP.

If you DO NOT have a specimen-based or ecological dataset, please go to <http://www.upb.pitt.edu/ainh/metadata/index.htm> and click on "No metadata to report? Click here".

If you know of a colleague who maintains a specimen or ecological biodiversity dataset, please feel free to pass this message to them.

The projected date of completion of the "state of the state" report on biodiversity is early 2002 and information compiled for that report, including a directory of Pennsylvania biodiversity datasets, will be made available through the PBP website (under construction). Background information about PBP is included on the URL for the metadata form.

If you have any questions or comments about this project or would like additional information about PBP, please feel free to contact me ([severson@pitt.edu](mailto:severson@pitt.edu)) or Sue Thompson, PBP Interim Executive Director ([sthomp@andrew.cmu.edu](mailto:sthomp@andrew.cmu.edu)).

Thank you for your valuable assistance.

Dr. Dessie Ann Severson  
Associate Director, Allegheny Institute of Natural History  
Director, Biology Program, Division of Natural Science  
University of Pittsburgh - Bradford  
300 Campus Drive / Fisher Hall 203 C  
Bradford, PA 16701  
Ph: (814)-362-7562  
Fax: (814)-362-5088  
E-mail: [severson@pitt.edu](mailto:severson@pitt.edu)

**ON THE WEB.....**

***International Plant Names Index (IPNI)***

[www.ipni.org](http://www.ipni.org)

With a plan to provide nomenclature and bibliographic information together in one site on all of the seed plants. The site is a collaborative effort between The Harvard University Herbaria, the Australian National Herbarium, and The Royal Botanic Gardens, Kew. When things are working, the site promises to be a great resource for plant nomenclature, at present you will need a lot of patience to use it.

***Animal Genome Size Database***

[www.genomesize.com](http://www.genomesize.com)

Haploid genome sizes are reported for over 2,900 organisms. Information is grouped according to simple biological classifications: 6 groups of vertebrates and 12 groups of invertebrates.

***Palmyra Atoll: Rainforest of the Sea***

[www.oneworldjourneys.com/palmyra/index.html](http://www.oneworldjourneys.com/palmyra/index.html)

This site covers the Palmyra Atoll, a tiny coral island in the Pacific Ocean, provides a dive into multimedia coverage of a *five-mile-long speck in 450,000 square miles of sea*. A fun activity!!!

***Zebrafish Information Network (ZFIN)***

<http://zfin.org>

Nine category headings serve to organize the diverse topics of the site. They include anatomical atlases, genetic strains, the genome zebrafish initiative, informatics, and related websites.

### PAS HIGH SCHOOL STUDENT RESEARCH GRANTS

The PAS has funds to provide modest financial support, not in excess of \$100, for student research projects. Students working on projects in the Natural or Physical Sciences under the direction of PAS member scientists at high schools, colleges, or in industry may submit an application for support.

**Proposal Guidelines:**

1. Funds are to be used primarily for supplies; secondarily, for small pieces of equipment if essential.
2. Funds are not to be used for major pieces of equipment, student stipends, travel, etc.
3. Proposals are encouraged that involve groups of students working together on a project.
4. Students are encouraged to present their findings at the next meeting of the Pennsylvania Junior Academy of Science (PJAS).

**Proposal Requirements:**

1. A title page with project title, name and grade of the student; sponsor name (PAS member); school name, address and phone number; characterization of school location (urban, suburban, or rural). The title page should also include the total amount requested (not to exceed \$100) and the signatures of student and sponsor.
2. A short summary of the project, including pertinent background information, a statement of the hypothesis, a description of the planned experiments, and a statement of the expected results.
3. Budget, including a statement of how the money will be used and a statement of the time frame during which the project will be performed.

**Proposal Deadlines:**

March 30 and November 15. Proposals received after a deadline will be reviewed during the following period.

Send completed proposals or requests for further information to:

J. Michael Campbell, Ph.D.  
Department of Biology  
Mercyhurst College  
Glenwood Hills, Erie, PA 16546.

Information on various research grants can be found on the PAS web site at <http://www.pitt.edu/~aap/pas.htm>

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## College Student Research Funds Available

The Pennsylvania Academy of Science has funds available to support UNDERGRADUATE AND GRADUATE COLLEGE STUDENT research in the natural, physical, or social sciences. Proposals should be written and submitted by the student under faculty guidance. Proposals will be accepted until May 1 at which time they will undergo review by professional referees, and evaluation by the PAS Research Grant Committee. Authors of proposals selected for funding will be notified by October 15. Unsuccessful applicants will be notified by November 15. Grants are normally made in the amount of \$500 or less, as requested in the proposal and, therefore, proposal budgets should take this limit to consideration.

### General Guidelines for proposal:

- (1) Projects should be of such nature that they can be initiated and completed within one year.
- (2) The PAS funds are to be used primarily for expendable supplies, small pieces of equipment, and travel, living and/or housing expenses, if essential for the project.
- (3) Funds are not to be used for major pieces of equipment.
- (4) Results of the project are normally communicated at the next meeting of the PAS following completion of the research. The student is encouraged to submit a manuscript for consideration of publication in the *Journal of the Pennsylvania Academy of Science*.

### Proposal Format should include the following Sections:

- (1) A titled INTRODUCTION describing the nature of the project and discussing the novelty or significance of the research. A general summary of the pertinent literature must be provided to demonstrate to the reviewers that the author has adequate knowledge of the research area.
- (2) A titled METHODS & MATERIALS describing how the research will be carried out; the kinds of materials and equipment used; the procedures to be employed regarding the care, use and disposition of research animals; the approximate starting and finishing dates of the research for which PAS funding is requested.
- (3) A titled STUDY PARTICIPANTS identifying the student(s) and supervising PAS member, their affiliation (eg., academic institution or employer), and position or section status. The role of the student(s) must be CLEARLY identified. The previous relevant experience of the PAS member in supervising research must be discussed. A statement is required that the research supervisor is a current PAS member. A statement should be made regarding primary responsibility for writing the proposal, if not the author(s) given.
- (4) A titled BUDGET will include an ITEMIZED budget showing how PAS funds are to be used, and identifying the piece of equipment and facilities currently available to do the research. If funding is to be supplied by other sources, this should be identified. Additional guidance regarding format can be found in the "Guidelines for Authors" in *Journal of the Pennsylvania Academy of Science*.

Submit an original and FIVE (5) copies of the proposal and clearly list on the cover page, the area to which the grant most closely applies: Biochemistry, Chemistry, Cell Biology, Ecology, Environmental Science, Genetics, Geology, Microbiology or other. All proposal reviews will be evaluated by the PAS Research Grant Committee, and the proposals will be ranked for preference for funding. Only those proposal judged worthy of funding will receive funding to the extent funding is available. Unsuccessful proposals may be reconsidered after revision in accordance with suggestions by the PAS Research Grant Committee and proposal referees. **Send all materials to: Dr. Jane Cavender, Chairman PAS Research Grant Committee, Dept. of Biology, Elizabethtown College, Elizabethtown, PA 17022.**

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**DARBAKER RESEARCH GRANT**

The Darbaker Research Grant is a monetary award established by the Pennsylvania Academy of Science (PAS) in 1989 to support creative biological studies using microscopic techniques. The maximum grant is \$500, and must be used to directly support the proposed research of qualified investigators who are current members of the PAS and will use microscopy (light, SEM, TEM, or other technologies) in their research. Funds were made available through a bequest of Dr. Leisure K. Darbaker, President of the PAS in 1939, and will continue as long as funds are available.

Recipients are expected to produce an original scholarly contribution suitable for publication in a refereed scientific journal. A manuscript reporting their results should be submitted for publication consideration within 12 months of completion of the research, with a copy transmitted to the Chairperson of the PAS Research Grants Committee. Although not required, award recipients are encouraged to submit the manuscript to the *Journal of the PAS*.

To be considered for a Darbaker Research Grant, an applicant must submit a scientific proposal describing in detail the intended study. The proposal must include:

- (1) an untitled introduction containing a review of the literature and clearly defining the objectives of the research,
- (2) a titled METHODS section detailing the use of microscopy and other techniques in the study,
- (3) a titled DISCUSSION section stating the merits of the expected contribution,
- (4) a titled LITERATURE CITED section, and
- (5) a BUDGET. For additional format guidelines, applicants are requested to follow the Information for Authors in the latest issue of the *Journal of the PAS*.

Applicants should submit an original and four (4) copies of the proposal and a cover letter to the Chairperson, PAS

Research Grants Committee. The cover letter must request

Formal consideration of the proposal for a Darbaker Research Grant, and provide the names and addresses of three (3) reviewers outside of the applicant's institution with documented expertise in the subject area of the proposed research. The cover letter must also indicate that the investigators agree to (a) submit their findings for publication consideration in a refereed scientific journal, and (b) acknowledge support by the Pennsylvania Academy of Science, through the Darbaker Grant, in their paper.

All application materials must be submitted to the Research Grants Committee no later than October 15<sup>th</sup> of the current calendar year for funding consideration for the following year. Unsuccessful proposals may be resubmitted for consideration in subsequent years, after appropriate revisions. The Research Grants Committee has full authority over the evaluation of proposals. The Committee will obtain at least two reviews from professional referees having documented expertise in the subject area of the proposed research. The Committee will make a final recommendation to the President of the PAS by December 15<sup>th</sup>, who will inform the successful recipient(s). The Committee will then contact unsuccessful applicants. Formal public announcement of the Darbaker Grants will be made at the annual meeting of the PAS.

Direct all inquiries about the Darbaker Grant, and application materials, to:

Dr. Jane F. Cavender  
Chairperson, PAS Research Grants Committee  
Department of Biology  
Elizabethtown College  
Elizabethtown, PA 17022-2298  
(717) 361-1448  
E-mail: [cavender@acad.ETOWN.EDU](mailto:cavender@acad.ETOWN.EDU)

## PENNSYLVANIA ACADEMY OF SCIENCE-APPLICATION FOR MEMBERSHIP

New members who are enrolled prior to December 31, 1998, may select a **FREE** copy of one of the following Academy Publications:

1. *Energy, Environment and the Economy*; 2. *Pennsylvania Coal*; 3. *Solid and Liquid Wastes: Management, Methods and Socioeconomic Considerations*

Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
 Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_ Middle Initial or Name: \_\_\_\_\_  
 Complete Mailing Address: \_\_\_\_\_  
 Institution: \_\_\_\_\_ E-mail: \_\_\_\_\_  
 Office Phone: (\_\_\_\_) \_\_\_\_\_ Home Phone: (\_\_\_\_) \_\_\_\_\_ Fax: (\_\_\_\_) \_\_\_\_\_  
 Branch of Science Main Interest: \_\_\_\_\_  
(Biology, Zoology, Botany, Physiology, Chemistry, Physics, Engineering, Spectroscopy, Biochemistry, Psychology, Medicine, Mathematics, Geology, Geography, etc.)

Degrees: \_\_\_\_\_ Title: \_\_\_\_\_

Where did you learn about PAS? \_\_\_\_\_

<b>Member of AAAS?</b> Yes	<b>PSTA</b> Yes	<b>PASA</b> Yes	<b>PA Chapter Wildlife Society</b> Yes
<b>Society of College Science Teachers</b> Yes	<b>PA Biological Survey</b> Yes	<b>PA Assoc of Environmental Professionals</b> Yes	
<b>Comm of PA Univ Biologists</b> Yes	<b>MidAtlantic Assoc College Biologists</b> Yes		
Active Member - \$ 35.00 per year	Student Member - \$17.50 per year	Sustaining Member - \$35.00 or more per year	
Life Member - \$525.00 ( <i>can pay in installments</i> )		Non-profit Institution/Library Member - \$45.00 per year	
For-profit Institution/Library Member - \$150.00 per year			
Back Issue of <i>Journal</i> - \$15.00 each (List desired issue) _____		Contribution to PAS _____	

Please return this application and first year's membership dues, made payable to the **Pennsylvania Academy of Science**, to:  
**Dr. Valerie G. Kalter, Membership Chairperson, Biology Department, Wilkes University, Wilkes-Barre, PA 18766.**  
**(570) 408-4752 or e-mail: [vkalter@wilkes.edu](mailto:vkalter@wilkes.edu)**

### Book Order Form

I want to order the following books:

- Ethics in Academia (\$50.00)
- The Era of Materials (\$50.00)
- Ecology of the Wetlands and Associated Systems (\$50.00)
- Forests – A Global Perspective (\$45.00)
- Environmental Contaminants, Ecosystems and Human Health (\$45.00)
- Medicine and Health Care into the Twenty-First Century (\$50.00)
- The Oceans: Physical-Chemical Dynamics and Human Impact (\$40.00)
- Biological Diversity: Problems and Challenges (\$40.00)
- Conservation and Resource Management (\$40.00)
- Global Climate Change: Implications, Challenges and Mitigation Measures (\$40.00)
- Natural & Technological Disasters: Causes, Effects and Preventive Measures (\$40.00)
- Science Education in the United States: Issues, Crises and Priorities (\$40.00)
- Air Pollution: Environmental Issues and Health Effects (\$40.00)
- Water Resources in Pennsylvania (\$40.00)
- Environmental Radon: Occurrence, Control and Health Hazard (\$40.00)
- Wetlands Ecology and Conservation (\$40.00)
- Management of Hazardous Materials and Waste (\$40.00)
- Ecology and Restoration of the Delaware River Basin (\$40.00)
- Contaminant Problems and Management of Living Chesapeake Resources (\$40.00)
- Environmental Consequences of Energy Production: Problems and Prospects (\$40.00)
- Endangered and Threatened Species Programs in Pennsylvania and other States: Causes, Issues and Management (\$40.00)
- Management of Radioactive Materials and Wastes (\$25.00)
- Hazardous and Toxic Wastes (\$35.00)
- Solid and Liquid Wastes (\$25.00)
- Pennsylvania Coal (\$15.00)
- Energy, Environment and the Economy (\$15.00)

TOTAL COST OF BOOKS ORDERED: \$ \_\_\_\_\_

Include \$5.00 Postage and handling per order: \$ 5.00

PA residents please add 6% sales tax\* : \$ \_\_\_\_\_

**TOTAL REMITTED:\$** \_\_\_\_\_

\* Non profit Organizations, please provide tax exempt number:

\_\_\_\_\_

**Discounts on orders of 10 or more copies of a single title.**

*This book order form, together with the appropriate payment made payable to The Pennsylvania Academy of Science, should be sent to: Dr. Shyamal Majumdar, Department of Biology, Lafayette College, Easton, PA 18042.*

Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_ Middle Name or Initial: \_\_\_\_\_  
 Complete Mailing Address: \_\_\_\_\_

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