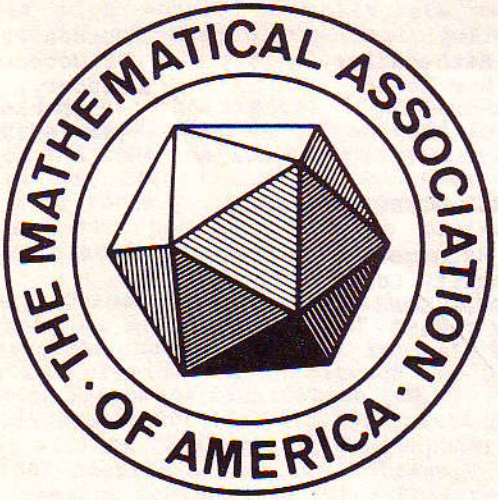
NORTHEASTERN SECTION



NEWSLETTER

SPRING 1986

VOLUME 8 NUMBER 1

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FUTURE MEETINGS

NEW ENGLAND SECTION - MAA

FALL, 1986

The Fall, 1986 Meeting will be held at **Worcester Polytechnic Institute** in Worcester, Massachusetts on November 21, 22, 1986. The theme of the meeting will be "Mathematics of Computer Science". **Peter Christopher** of the Worcester Polytechnic Institute is the Local Arrangements Chair.

FALL, 1987

The Fall, 1987 Meeting will be held at Bentley College. The Fall Meeting is held on the last weekend before Thanksgiving.

MESSAGE FROM THE CHAIR

The Northeast Section has been well served! The records of the Section reveal that **Thurmon Whitley** as Chair and **Jim Ward** as Governor have guided the Section through a period of membership growth, increased activity, especially student involvement, and unprecedented financial stability. Several initiatives begun during the past two years will continue to receive emphasis. Among these are the increasing participation of university faculty in the Section, monitoring articulation concerns for the transition from high school to collegiate mathematics and encouraging student involvement in the discipline through Section activities.

New initiatives to promote student involvement will include sponsorship of Mathematics Clubs by an affiliation agreement with the Section and coordination and conducting of mathematics competitions in the reigon. Other concerns that need our attention are long range planning for the Section and for the national MAA and the promotion of the profession and the discipline to both students and the public.

Administratively, **Gordon Prichett** has given notice that he will conclude his term as Secretary/Treasurer this academic year. **H. T. (Pete) Hayslett** has agreed to be our Placement Test Representative and provide liason between our Section and the MAA's Committee on Placement Examination (COPE). We are looking for program chairpersons for the Fall 1986 meeting at W.P.I., at which the theme will be "Mathematics of Computer Science", and for the Fall 1987 meeting at Bentley College. The Nominating Committee will present nominees for Vice Chairperson, Two-Year College Representative, and Secretary/ Treasurer at the Fall 1986 meeting at Worcester Polytechnic Institute.

On your calendar, note that National Mathematics Awareness Week is April 14-20. June 13, 14 is the Spring Meeting at the University of New Hampshire, and our Fall meeting is November 21, 22 at W.P.I.

Positions of responsibility in the Northeast Section range from committee membership to program chairs to Section officers. Each offers a unique opportunity for service to the profession that can be satisfying and rewarding — and is temporary! Your expression of interest would be most welcome.

Please note that the upcoming meeting at the University of New Hampshire has as its theme "How do we improve the teaching of undergraduate statistics?", and is a joint meeting with the Boston Section of the American Statistical Association. See you there!

Steven K. Ingram
Chairperson

GOVERNOR'S MESSAGE

In February all MAA members received an "urgent message" from Ken Hoffman, Director of Federal Relations for AMS, MAA and SIAM, asking us to write our congressmen and senators urging support for the creation of "National Mathematical Awareness Week" from April 14-20, 1986. As Ken put it, "this is not a trivial matter. With the recent passage of the Gramm-Rudman-Hollings balanced budget legislation, drastic funding cuts are expected. The creation of a national week will be used by the mathematics community to present the case against erosion of support for mathematics." I mailed the letters Ken provided to my congressman and senators and I hope all of you did too.

Ken Hoffman's appointment as our Director of Federal Relations was a result of the mathematical community's recogintion of the fact that we are profoundly affected by the decisions taken in Washington. We, no less than other interest groups, must communicate our professional opinions to the Washington decision-makers in an effective and timely manner, and it is part of Ken's job to tell us when and how to do it.

That said, I want to pass along another request for letters which Ken made at the Board of Governors meeting in New Orleans in January. Last October, at the first meeting of the Mathematical Sciences Education Board, Congressman Don Fuqua (D-Florida), Chairman of the House Committee on Science and Technology, made a speech in which he spoke of the need to regard mathematics education as being different from, and fundamental to, science education. I have asked the editor to include an excerpt from Fuqua's speech elsewhere in this Newsletter so that you may read some of what he said (Page 12). Ken Hoffman pointed out to the Board of Governors that this is one of the first times that someone in Congress has made a distinction between support for mathematics and support for "science and mathematics". Ken also said that it is important for Representative Fuqua to know that there are people who support his views and he urged those of us who agree with him to write the Congressman (Honorable Don Fuqua, U.S. House of Representatives, Washington, D. C. 20515) and tell him so. I have written such a letter and I hope many of you will consider doing the same.

James E. Ward
Governor

MINUTES OF THE FALL 1985 MEETING

The annual Fall Meeting of the Northeast Section was held on November 22-23, 1985 at Massachusetts Maritime Academy in Buzzards Bay, Massachusetts. There were approximately 145 in attendance.

Invited Addresses

Reflections of a Problem Editor, by **Clayton W. Dodge**, University of Maine at Orono.
Does Statistics Make Sense?, by **Samuel Gutmann**, Northeastern University
Cayley Graphs and Surfaces, by **Thomas Tucker**, Colgate University
Use of Mathematics in War Gaming and Interactive Simulation, by **Richard P. Adams**, CDR, U.S.N. (Retired)
Mathematics Research Opportunities with NSA, by **James R. Maar**, Statistical Technique, NSA
The 'Plight' of College Students Who Have Studied Calculus in High School, by **Donald B. Small**, Colby College

Contributed Papers

Shape Recognition, Symmetry and Bifurcation Sets by **Peter Giblin**, University of Liverpool/University of Massachusetts-Amherst
Uncountability and Cantor's Diagonal: A Second Visit, by **Robert Gray**, Prime Computer, Inc.
Thomas Jefferson and Spherical Trigonometry, by **James Tattersall**, Providence College
Algebraic Method to Find Primes, by **Raoul Freyre**, University of Lowell
Rational Relativity, by **Torrence Gurman**
On the Orthogonality of Eigenvectors of Non-symmetric Matrices, by **Herbert Nichol**, Drexel University
Regular Graphs of Minimum Diameter, by **C. Edward Sandifer**, Western New England College
Holor Formulation of Thevenin's Theorem, by **Domina Everle Spencer**, University of Connecticut

Student Papers

The Hotel Problem, by **Joseph Gregorio**, Eastern Connecticut State University
A Domino-Checkerboard Problem, by **George Young**, Western New England College
Application of Idon Theory to Solar Energy, by **Shama Y. Uma**, University of Connecticut

At the business meeting it was reported that the section is in excellent financial condition, book awards were presented to the three students delivering student papers, **Steve Ingram** was elected the new section Chairperson, and Governor **Jim Ward** described the outgoing Chairperson **Thurmon Whitley** as a "tough old dog to keep under the porch".

Respectfully submitted,

Gordon D. Prichett
Secretary-Treasurer

NORTHEAST SECTION TO SPONSOR SHORT COURSE ON LINEAR ALGEBRA

Professor **Alan Tucker** will return to the University of Maine at Orono June 9-13, 1986, to present a series of lectures on *A New Unified Approach to Linear Algebra*. Prof. Tucker is chairman of the Department of Applied Mathematics and Statistics at the State University of New York at Stony Brook. Jointly sponsored by UMO and the Northeast Section of the MAA, the week-long course for college teachers of mathematics and computer science will include morning, afternoon, and evening sessions, as well as the usual mid-week trip to Bar Harbor and the famed lobster-steak Thursday night banquet, concluding with lunch Friday noon.

Applications will be introduced at the outset to motivate subsequent mathematics in this new unified approach to linear algebra that can be taught with a prerequisite of one semester of college calculus (for most of the material). Insights gained from numerical analysis and various applications seem to provide a superior way to develop a conceptual understanding of most linear algebra theory.

The cost of the short course, including course fee, double-occupancy room, and board, is still only $200. For more information contact Professor Clayton W. Dodge, Mathematics Department, Universtiy of Maine, Orono, ME 04469-0122.

GRAPH THEORY CONFERENCE

The Fourth Annual Downeast Graph Theory Conference sponsered by Colby College and the Northeastern Section of the MAA will take place at Colby From Noon, Monday, May 12 to Noon, Tuesday, May 13. The principal speaker will be **Edward Swart** of the University of Guelph, presenting talks entitled *A Linear Programming Approach to the Hamiltonian Circuit Problem*, and *A Modified Version of Karmarkar's Algorithm*.

If you would like assistance with accomodations contact Dale Skrien, Department of Mathematics, Colby College, Waterville, Maine, 04901, (Phone: 207-872-3256)

CALL FOR STUDENT PAPERS

Students (and recent graduates) are invited to present papers at the Spring Meeting on topics in mathematics, statistics, or computer science. The presentations will be 15 to 20 minutes in length, on either expository work, research projects, employment experiences, or problems from math periodicals. Prizes will be awarded.

Almost every college/university has students working on projects, problems, and minor mathematical research. The success of a student paper session depends primarily on faculty members identifying prospective papers, encouraging their students, and arranging department financial support when possible. If there are no potential student papers on your campus for the Spring Meeting, we urge you initiate student projects now for presentation at the Fall Meeting.

Interested students should send an abstract and current address, with phone number, by May 23 to: Dennis M. Luciano, Department of Mathematics and Computer Science, Western New England College, Springfield, MA 01119 (413-782-3111 Ex. 275). All proposals will be reviewed by Department faculty members.

Abstracts for the Fall Meeting should be sent to the same address by October 31, 1986.

CALL FOR CONTRIBUTED PAPERS

At both the Spring and Fall Meetings we will have contributed papers sessions. Members are urged to participate; let your colleagues know what your are doing!

Abstracts for the Spring Meeting should be sent by May 23 to: Gail Lange, Department of Sciences and Mathematics, University of Maine at Farmington, 112 Main Street, Farmington, ME 04938.

If you are not prepared to talk at the Spring Meeting it is not too early to start thinking about the Fall. Abstracts for the Fall Meeting should be sent to the same address by October 31, 1986.

CHINA - Summer 1986

The Ministry of Science and Technology of the People's Republic of China has invited a delegation of mathematicians, computer scientists, and other mathematical scientists to tour China for the purpose of exchanging ideas and information. The tour departs San Francisco on 18 June, 1986, with a return date around 6 July, 1986. Members of the delegation will be expected to prepare a presentation on a topic in their field of expertise which would be of interest to our Chinese counterparts.

For more information contact:

Mel Nyman, Chair
Mathematics and Computer Science
Alma College
Alma, MI 48801 (517) 463-7264

NORTHEASTERN SECTION OF THE MAA
and
BOSTON SECTION OF THE ASA

JOINT SPRING MEETING
June 13-14, 1986

UNIVERSITY OF NEW HAMPSHIRE
DURHAM, NEW HAMPSHIRE

PROGRAM

FRIDAY, JUNE 13

3:00-6:00 Registration: McConnell Hall (first floor lounge)

4:00-6:00 Exhibits of computer software and textbooks

4:00-4:50 ***Statistics for Everyone — Why or Why Not***
Michael Rood, Asuntuck Community College

5:00-6:00 Social Hour

6:15-7:30 Banquet

7:50-8:00 Welcoming Address

8:00-9:00 ***The Statistician Goes to Court***
Stephen Fienberg, Carnegie-Melon University

9:15-11:15 Wine and Cheese

SATURDAY, JUNE 14

8:00-10:00 Registration: McConnell Hall (first floor lounge)

8:00-8:40 Student Contributed Papers

9:00-12:30 Software Exhibit

8:50-9:40 ***Nearness Relations Among Measures of Central Tendency and Dispersion***
Warren Page, New York City Technical College, City University of New York

9:50-10:40 ***A Bayesian Analysis of the Bernoulli Process***
Ramona Trader, University of Maryland (College Park)

10:40-11:00 Coffee Break

11:00-11:50 ***Influence and Collinearity in Regression: What Students Need to Know About Regression Diagnostics***
David Hoaglin, Harvard University

12:00-1:20 Lunch

1:20-2:20 Panel Discussion: ***Use of the Computer in Teaching Statistics***

John McKenzie, Babson College
Bob Goldman, Simmons College
Terrence Tivnan, Harvard University (Graduate School of Education)

3:00-4:00 Contributed Paper Session

2:30-4:00 Case Studies:

(1) ***Getting it Right Consistently: Experimental Design***
Ken Constantine, University of New Hampshire

(2) ***Are Male and Female Teachers Paid Differently?***
Arlene Ash, Boston University School of Medicine and School of Public Health

(3) ***Making Clinical Trials More Efficient***
David Harrington, Dana-Farber Cancer Institute and Harvard School of Public Health

4:10-4:30 Business Meetings

MEETING ORGANIZERS - SPRING, 1986

Arlene Ash, Boston University, Program Co-chair
Homer Bechtell, University of New Hampshire, Local Arrangements
Steve Kenton, Eastern Connecticut State University, Software/Textbook Display
Ginnie Knight, Western New England College, Organizer for Bayesian presentation
Gail Lange, University of Maine-Farmington, Program Co-chair
John McKenzie, Babson College, Program Co-chair
Jean Smith, Middlesex Community College (Connecticut), Organizer for two-year presentation

ACKNOWLEDGEMENT

The Section is grateful to the **Unionmutual Life Insurance Company** for a grant which supported the publication and mailing of this *Newsletter*. Unionmutual, an employer of many actuaries, encourages mathematics faculty to make their students aware of actuarial opportunities.

ABSTRACTS OF SEVERAL PRESENTATIONS

INFLUENCE AND COLLINEARITY IN REGRESSION: WHAT STUDENTS NEED TO KNOW ABOUT REGRESSION DIAGNOSTICS
David Hoaglin, Harvard University

Any course that introduces least squares regression with two (or more) explanatory variables should include the basic regression diagnostics. To expose influential observations, these focus on leverage (via the hat matrix), studentized residuals, and measures of impact on estimated regression coefficients and fitted y-values.

To identify exploratory variables that have a high degree of collinearity, diagnostics decompose the covariance matrix of the regression coefficient estimates.

Students can approach these techniques at several levels of sophistication, and even a rudimentary understanding promotes a clearer appreciation of the strengths and weaknesses of regression.

USE OF THE COMPUTER IN TEACHING STATISTICS
John McKenzie, Babson College - Chair
Bob Goldman, Simmons College
Terrence Tivnan, Harvard University

All statistics courses, especially applied statistics courses, should take advantage of today's computing environment. In this session educators from three very different types of schools will offer their experiences on the use of statistical software in the classroom. Each will discuss the benefits and disadvantages of using such software.

TRAVEL

The University of New Hampshire is located in Durham, 9 miles west of Portsmouth on Route 4. We are 1 hour, 20 minutes north of Boston via I-95, 2 hours from Worcester, MA via I-495 and I-95, and 3 hours from Hartford, CT.

REGISTRATION

Registration will be held in the first floor lounge of McConnell Hall, Friday 3-6 p.m. and Saturday 8-10 a.m. Parking may be found adjacent to this building.

ACCOMMODATIONS

Housing will be available in the student dormitories. Only a few minutes walk separate each of the activities and the downtown area.

Breakfast may be tailored to your appetite. Restaurants and their location will be identified at registration.

Only a limited number of "walk-ins" can be accomodated for either housing or meals on campus.

Suggestions for hotel/motel arrangements are as follows:

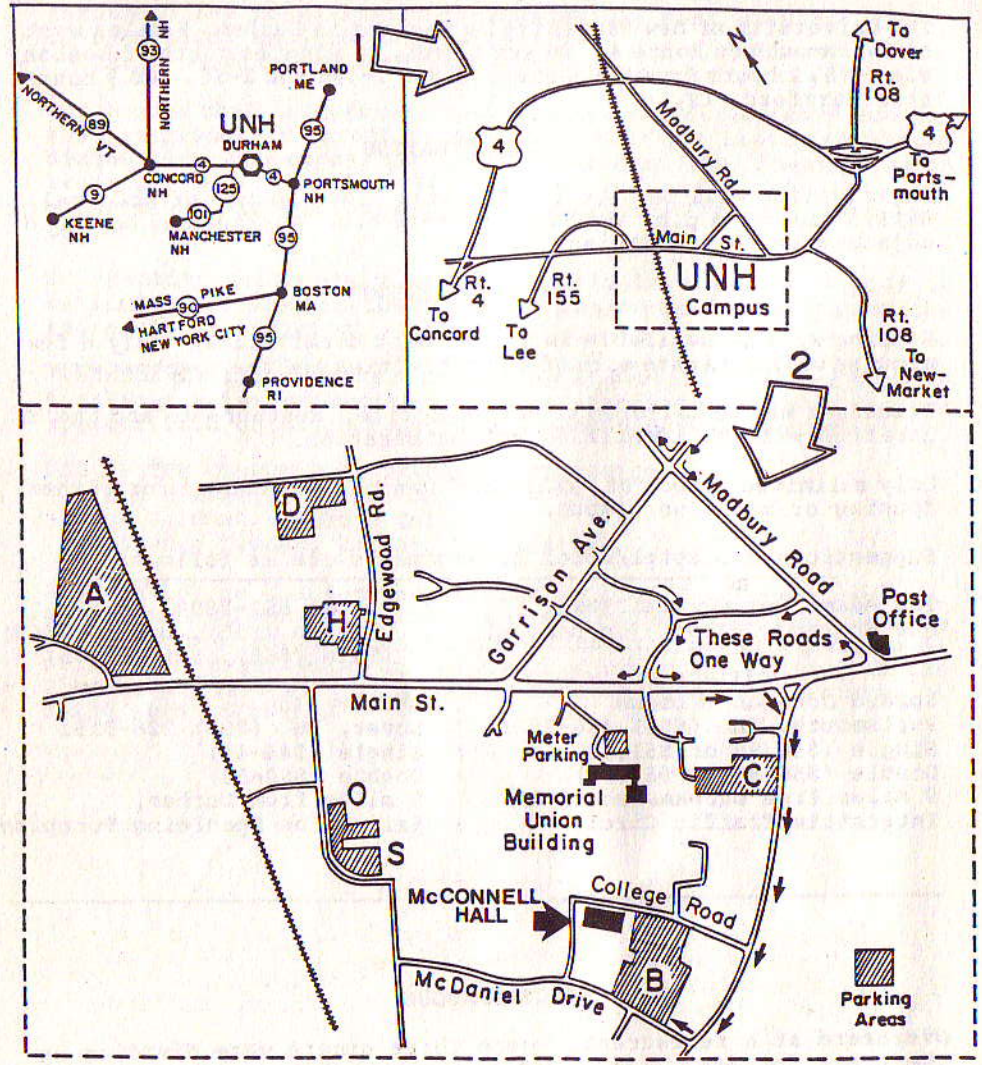
The Adams Residential Tower New England Center (on campus)	(603) 862-2800 Single ($55), Double ($60) Twin ($65), Suite ($75)

Howard Johnson's Lodge Portsmouth, NH (603) 436-7600 Single ($56.90 or $61.90) Double ($56.90 or $67.90) 9 miles from Durham, Route 1 Interstate Traffic Circle	Quality Inn Dover, NH (800) 228-5151 Single ($44-48) Double ($50-56) 5 miles from Durham, Exit 8E on Spaulding Turnpike

MISCELLANEOUS

Overheard at a restaurant, where three diners were dividing up the check for $8: "Let's see now; divided four ways it's $2, and divided two ways it's $4, so three ways it must be $3".

In the Fall, 1985 issue of this Newsletter our Past-Chair's first name is spelled three ways - Thurmon, Thurman, and Thurmond Whitley. This editor will take the blame only for not perceiving the misspellings in submitted copy, and hasten to point out that it was spelled correctly twice. Sorry, Thurmin.



SOFTWARE EXCHANGE

Copies of the Microcomputer Software Exchange list will be available at the registration desk at the Spring meeting. Also, you may obtain a copy by sending $1.00 to Steve Snover, University of Hartford (West Hartford, CT 06117), or Thurmon Whitley, University of New Haven (West Haven, CT 06516).

Some current titles on the list are: Class Roster, Nim, Markov Chains, Least Squares Line and other Statistics Programs, Combinatorics Programs, Linear Programming, Operating Room Simulation, Eigenvalues and Eigenvectors, etc., etc.

We need listings for Commodores, IBM's, Apple IIc's and Apple Macintosh's. If you have written public domain programs for any of these machines, please send the relevant information to either Steve Snover or Thurmon Whitley.

COMPUTER SOFTWARE INFORMATION SOUGHT

Jean Smith, our Two-Year College Representative, is seeking information about software that is applicable to the teaching of mathematics. Jean states that several members have voiced the complaint that they have no idea about what software is good and applicable, and that the meetings they go to where software is displayed are aimed at people who are already knowledgeable.

Jean is therefore requesting input from members about specific experiences with specific software; both good and bad experiences are solicited. Jean has offered to organize such information and make it available. If you have information which you can share with others (it does not have to be elaborate), please send same to Prof. Jean Smith, Middlesex Community College, 100 Training Hill Road, Middletown, Conn. 06457.

EDITOR'S MESSAGE

Information is solicited concerning future meetings of the following organizations: ATMEM, ATOMIC, ATOMIM, NEW HAMPSHIRE, RIMTA, VCTM, NCTM, AMATYC, NEMATYC, BS-ASA, AMA, and any other appropriate organizations which are not already mentioned in FOCUS.

Friday, September 12, 1986 is the date by which all material for the Fall 1986 issue of the Newsletter must be in the hands of the editor, Philip Mahler, Math Department, Middlesex Community College, Springs Road, Bedford, MA 01730, (617)-275-8910 (School), (617)-369-9499 (Home).

REMARKS BY
HONORABLE DON FUQUA (D-FL), CHAIRMAN
U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON
SCIENCE AND TECHNOLOGY

THE FIRST MEETING OF THE
MATHEMATICAL SCIENCES EDUCATION BOARD

NATIONAL RESEARCH COUNCIL
WASHINGTON. DC
OCTOBER 29, 1985

MATHEMATICS AS A FOUNDATION DISCIPLINE

Perhaps this is a good point at which to make some important distinctions between science and mathematics education. Of the two disciplines, we can say that mathematics is fundamental to the study of most areas of science while the rreverse is rarely true. Thus mathematics is a foundation discipline, a necessary starting point for moving into many other directions and disciplines.

In addition, the study of mathematics as a discipline helps to develop our critical thinking skills which are applicable to virtually everytinng else we need to think about. Several years ago, when the ground swell reactions began about our nation-wide deficiencies in science and mathematics education, there was simultaneous evidence from the results of standardized tests that there was also a drop in the level of critical thinking skills in school age children.

It seems to me that despite the fact that science and mathematics have areas of commonality, we need to be careful not to always think about them collectively. Not only are there differences and distincitons between them, but also, mathematics often becomes a step-child in that process. The science disciplines have always been much more equipment and laboratory focused, while historically mathematics has been more of a pencil and paper process. In this arrangement, the ways for improving science education have been more tangible; you build more modern labs and equip them with the newest tools and instruments. I think the need to improve and update mathematics education has seemed much less crucial or visible, and has frequently taken a back-seat to equipping science facilities.

DETAILS OF REGISTRATION

Please type or print all items. Full payment must accompany this form and be in U.S.Dollars. Fees are transferable but nonrefundable after May 16, 1986. PLEASE MAKE CHECK PAYABLE to **UNH** and RETURN WITH THE FORM at right BY MAY 16, 1986 to:

UNH CONFERENCE OFFICE
PETTEE HOUSE
DURHAM, NH 03824 Tel. (603) 862-1922

NORTHEAST SECTION - MAA and BOSTON SECTION - ASA
JOINT MEETING PRE-REGISTRATION
JUNE 14-15, 1986

(See Page 12 for Registration Details)

Name_____

Street_____

City_____ State_____ Zip_____

Telephone_____ Male____ Female____

Affiliation_____

Soc.Sec#_____(necessary for refunds)

Nametag Info: Please indicate exactly how you wish your name to appear on name badge: _____

Special Considerations: ____Smoker ____Non-Smoker ____No Stairs
____Near Bathroom ____Wheelchair

Other:_____

Roomate Requests 1. _____

2. _____ 3. _____

Spouse's Name (If attending): _____

REGISTRATION $10.00 _____
($5 for unemployed members/students, or free for students if registration is accompanied by evidence of student status from a faculty member.)

FRIDAY BANQUET $11.00 _____
(includes wine/cheese social)

SATURDAY LUNCHEON $7.25 _____

DORMITORY ROOM Single $16.00 _____
(Friday night)

Double $14.50/person _____

TOTAL _____

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