MARYLAND—DISTRICT OF COLUMBIA—VIRGINIA SECTION OF THE MAA NEWSLETTER

Vol 8 No. 2 Oct. 86

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Vol. 8, No. 2 Editor: John Milcetich Oct. 1986

FALL MEETING

The Fall meeting of the Maryland-District of Columbia-Virginia section of the MAA will take place at Loyola College in Maryland on November 21-22, 1986. Sr. Helen Christensen of Loyola College will conduct a workshop on Elementary Graph Theory on Friday afternoon from 4:30 - 6:00 pm in Room 301 of Maryland Hall. No advanced registration is necessary nor is there a charge for the workshop. It is open to all interested persons subject only to the capacity of the room. A banquet will follow in the Andrew White Club on the campus. Our banquet speaker is Dr. Harold Reider of the University of North Carolina-Charlotte who will speak on "Snapshots in Mathematical Decision Making". The Treasurer must receive your banquet reservations by November 15. The preregistration form appears later in the newsletter. The invited address on Saturday will be given by Paul K. Stockmeyer of the College of William and Mary. His talk is entitled "Is Discretion the Better Part of Mathematics?". Details of the banquet and abstracts of the talks may be found elsewhere in the newsletter. The Andrew White Club will have lunch available on Saturday afternoon for anyone interested.

LOYOLA COLLEGE IN MARYLAND

Loyola College in Maryland was founded in 1852 by members of the Society of Jesus. It is the ninth oldest among the 28 Jesuit colleges and universities in the United States. The college occupies a scenic 45-acre campus in the northern suburbs of Baltimore City.

Loyola is comprised of the College of Arts and Sciences and the Joseph A. Sellinger, S. J. School of Business and Management. It offers 30 undergraduate majors and five pre-professional programs. The curriculum provides a strong background in liberal arts and a broad selection of elective courses that encourages students to stretch their skills, talents and abilities.

There are approximately 2700 undergraduate students enrolled at Loyola representing twenty states and three hundred high schools. Forty percent of these students are commuters; the remainder are campus residents, living in dormitories and

apartments. The ratio of male to female is 50:50. More than half of the freshman class ranks in the top fifth of their high school class.

Loyola fields 14 intercollegiate teams and competes at the NCAA Division I level.

The Department of Mathematical Sciences has ten full-time faculty members. After pursuing a basic sequence consisting of three semesters of Calculus, Linear Algebra, Probability and Statistics and Discrete Methods, a student enrolled in the mathematics program selects a concentration which then determines his or her schedule of upper division courses. Concentrations are offered in Pure Mathematics, Computer Science, Actuarial Science, Statistics, Operations Research, Secondary Education and Applied Mathematics. Graduates of the program have pursued advanced degrees at such schools as Purdue, Michigan, Penn State, Northwestern, Carnegie-Mellon, Iowa State and Oxford.

TRAVEL AND LODGING

The enlosed maps show the location of Loyola College (at the corner of Charles Street and Cold Spring Lane) with respect to the Baltimore Beltway (I-695) and I-83. In addition the map is marked with the location of the hotels and motels listed below. The prices listed are those that were quoted over the phone in early September (D - double, S - single). Rates seem to vary a great deal, depending on the time of the year. Some of these hotels occasionally offer special weekend rates or packages. You should inquire about this possibility when you make your reservation. We were unable to obtain any reduced rates.

Downtown

Days Inn 100 Hopkins Place	301-576-1000	D $77	S $69
Holiday Inn Howard & Lombard Streets	301-685-3500	D $74	S $64
Hyatt 300 Light Street	301-528-1234	D $119	S $104
Omni 101 W. Fayette	301-752-1100	D $100	S $84
Sheraton 300 S. Charles Street	301-962-8300	D $120	S $105

Suburban

Belvedere Charles & Chase Streets	301-332-1000	D $80	S $70
Cross Keys 5100 Falls Road	301-532-6900	D $84	S $70
Holiday Inn 2204 Greenspring Drive, Timonium	301-252-7373	D $70	S $60
Quality Inn 1015 York Road, Towson	301-825-9190	D $62	S $56

BANQUET

There will be a banquet on Friday evening, November 21, at 6:30 pm in the Multipurpose Room of the Andrew White Student Center. A cash bar will be open from 6:30 - 7:15 pm and the banquet will begin at 7:15 pm. The cost of the banquet is $14. The menu is:

Chilled Fruit Cup
London Broil with Mushroom Sauce
Tossed Salad Bowl
Baked Potato
Peas with Mushrooms
Dinner Rolls
Assorted Cakes
Coffee and Tea
Glass of Wine (Red or White)

EXHIBITS AT THE MEETING

We are pleased to announce that there will be an exhibit during our Fall meeting at Loyola College of publications from the MAA and from Computer Science Press of Rockville, MD. Please make a point of visiting the exhibit room while at the meeting and browsing through the publications on display.

FROM THE CHAIRMAN

A Nominating Committee has been formed consisting of Howard Penn (U. S. Naval Academy), Chair, Mary Kay Abbey (Montgomery College) and Don Peeples (Mary Washington College). Their job will be to submit a slate of candidates for the positions of Treasurer and Vice-Chairman for Membership at the Spring 1987 meeting of the section. Anyone wishing to place a name in nomination is invited to correspond with any of the committee members.

You may recall that at the meeting of Spring 1986 it was mentioned that work was being done on holding our Spring 1987 meeting jointly with the Virginia Council of Teachers of Mathematics. Sadly, this venture had to be abandoned. VCTM was already committed to holding their meeting at the Tysons Corner Marriott, a facility not large enough to accommodate additionally the members of our section of the MAA who would likely attend. We are still considering a joint meeting in the near future, but the earliest possible occasion would be spring 1988.

Taking the suggestion of Chairman-Elect Elizabeth Teles, the Spring 1987 meeting has been set for Saturday, June 13, at Salisbury State College on the Eastern Shore of Maryland. The late date, while sure to inconvenience some, was selected to coincide with the weekend between the two mini-courses annually offered at Salisbury State College. It is our hope that individuals attending one or both of the mini-courses would consider extending their stay in order to attend our meeting. In addition, those of us in teaching might discover that a weekend in early June is more convenient than a weekend just a short time before the hectic end of the the spring semester. Don't overlook the possibility of bringing the family with you and then driving to the shore after the meeting for rest and relaxation.

While a little nervous about departing from our traditional meeting time, we look forward to this experimental format and hope that it will prove popular. Thanks to the administration and faculty of the Department of Mathematical Sciences at Salisbury State College for assuming this additional burden and responsibility.

- Robert Lewand

SCIENCE AND ENGINEERING DOCTORATES IN 1985

The October 1986 issue of the Notices of the American Mathematical Society summarized some information on the output of doctorates awarded during 1985 (taken from the National Science Foundation Sciences Resources Studies Highlights). The number of science and engineering (S/E) doctorates awarded in 1985 was 18255, which was slightly above that of 1984 and 7% above the recent low peak in 1978. In mathematics there were 689 doctorates, 18% below the 1978 figure of 838. There were 311 doctorates in computer science representing an increase of 190 (157%) from the 1978 figure. Although S/E doctorates have been increasing, the total is still 4% below the peak production in 1972. Non-U. S. citizens earned 4850 S/E doctorates in 1985 an increase of 10% over 1984; this represents 28% of all S/E doctorates awarded. Of the total number of S/E doctorates, 3165 were awarded in engineering (a 9% gain over 1984) and 15900 were awarded in science (slightly less than the 1984 figure). Women continue to increase their representation among the S/E doctorate recipients. The 4650 degrees earned by women in 1985 were 2% more than those of 1984, yet this was significantly below the 6% average annual increase over the past ten years. An overall trend

since 1978 has been that gains in the numbers of doctorates awarded women and non-U. S. citizens have offset the continuing decline for U. S. male participants. Within science fields, the number of doctorates in natural sciences has risen 10% since 1978 while that for the social and behavioral sciences has declined 6%.

COMPLIMENTS OF MATH CLIPS

What is a "zero-knowledge" proof? The idea is that a "prover" has a proof of a theorem and wants to let a "verifier" know that the prover knows the proof; however the prover does not want to reveal the proof itself. The verifier is permitted to ask some special questions of the prover to which a yes or no answer can be given. The prover can give the correct answer each time if he knows the proof; otherwise he only has a 50% chance to do so. If enough questions are asked, the chances of fooling the verifier are very small. The interesting thing is that neither the question nor the possible answers give the verifier any hint of the proof. Shafi Goldwasser and Silvio Micali (both of MIT) and Charles Rackoff (University of Toronto) first defined the concept of a zero-knowledge proof last year. The concept has applications for password protocols and cryptological games like tossing a coin by telephone or exchanging secret keys. For a bit more information, see the article "Keeping Secrets" by Ivars Peterson in Science News, vol. 130, no. 9, 140-141.

The National Urban Coalition, as part of its Equal Access to Science, Math and Technology Project, is helping parents, community groups, churches and schools to organize local Family Math Courses. A typical Family Math course may include six to eight sessions aimed at giving parents and children (K-8) opportunities to develop problem solving skills and to build an understanding of mathematics using "hands-on" experiences. In addition to arithmetic, other topics covered include ability to visualize spatial relationships, to estimate, to interpret data and to reason mathematically. Anyone interested in this project may contact EASMT Project, National Urban Coalition, 1120 G Street, NW, Washington, DC 20009, (202) 628-2990.

EDITOR'S NOTE

Items to be considered for inclusion in the next newsletter should be received by the newsletter editor (John Milcetich, Department of Mathematics, University of the District of Columbia, Washington, DC, 20008) by January 31.

The Maryland - District of Columbia - Virginia Section of
The Mathematical Association of America

Fall Meeting
Friday November 21 and Saturday November 22, 1986
Loyola College
Baltimore, Maryland

Friday November 21, 1986

4:30 - 6:00 Room 301 Maryland Hall	Workshop in Elementary Graph Theory Sister Helen Christensen, Loyola College Advanced registration not required. Participation in the Workshop is open to all interested persons but may be limited if the demand exceeds the capacity of Room 301.
6:30 Andrew White Student Center	Cocktail hour and cash bar
7:15 Andrew White Student Center	Banquet and speaker INVITED ADDRESS "Snapshots in Mathematical Decision Making" Dr. Harold Reider The University of North Carolina-Charlotte Advance registration required by November 15. Preregistration form on the last page. Details available in the newsletter.

Saturday November 22, 1986

ALL TALKS AND MEETINGS WILL BE HELD IN MARYLAND HALL (also known as Ruzicka Hall).

8:00 - 11:00 12:30 - 1:00 Foyer: Maryland Hall	Registration
8:30 - 11:000 Foyer: Maryland Hall	Coffee and donuts available
8:40 200 Maryland Hall	"Welcoming remarks" David Roswell, Dean Loyola College, Baltimore, MD.

SESSION BEGINNING AT 9:00 A M

300 Maryland Hall — "Mereologic Relations and an Associated Graph-Theory Problem"
A. J. Goldman and S. J. Steinsaltz, Department of Mathematical Sciences, The Johns Hopkins University.

301 Maryland Hall — "The Interest Factor as a Time Shift Operator"
Clifford J. Maloney, Bethesda, MD.

313 Maryland Hall — "A Simplified Derivation in Reliability Theory"
James P. Coughlin, Towson State University and Robert Baran, U. S. Naval Surface Center, Sivler Spring, MD.

314 Maryland Hall — "Physics Is Legislated by a Cosmogony"
Robert A. Herrmann, Mathematics Department, U. S. Naval Academy.

SESSION BEGINNING AT 9:30 A M

300 Maryland Hall — "Using the Binomial Theorem in Combinatorial Inequalities"
Craig Bailey, U. S. Naval Academy.

301 Maryland Hall — "Which Graph Groups Have FGIP?"
Carl Droms, James Madison University.

314 Maryland Hall — "Analysis of Jumping Games"
Arthur Benjamin, Graduate Student, The Johns Hopkins University.

400 Maryland Hall — "The Effect of Stratification on Testing for Differences in Rate Functions"
Richard E. Auer, Loyola College.

SESSION BEGINNING AT 10:00 A M

300 Maryland Hall — "The Mathematician's Attic: Treasures of the National Collections"
Peggy Kidwell, Division of Mathematics, National Museum of American History.

301 Maryland Hall — "The Headless Horseman Rides the Land!" or "Parstrat! Parity for Strategy with Taactics!"
John Hays, Naval Research Laboratory.

313 Maryland Hall — "Orthogonality in Latin and Frequency Squares"
Larry J. Brant and Joseph H. Holman, Gerontology Research Center, National Institute on Aging, Baltimore, MD.

314 Maryland Hall — "A Fuzzy Set Definition of Disability"
John C. Hennessey, Loyola College.

SESSION BEGINNING AT 10:30 A M

300 Maryland Hall — "Singularities of Harmonic Functions in Spherical Eulerian Coordinates"
Peter A. McCoy, U. S. Naval Academy

301 Maryland Hall — "Three Especially Interesting Problems for Undergraduates"
James J. Corbet and David L. Albig, Radford University.

313 Maryland Hall — "Graph Theoretic Models for the Liberal Arts Mathematics Course"
Sister Helen Christensen, Loyola College.

314 Maryland Hall — "Methods of Apportionment"
Suzanne Sands, Goucher College.

11:00 A M — MAA BUSINESS MEETING - 200 Maryland Hall

11:45 - 12:45 LUNCH — (Lunch is available on campus at the Andrew White Club)

200 Maryland Hall — INVITED ADDRESS 1:00 - 2:00 P M
"Is Discretion the Better Part of Mathematics?"
Paul K. Stockmeyer, Department of Computer Science, College of William and Mary.

SESSION BEGINNING AT 2:00 P M

Maryland 300 — "Diagonalization of Complex Symmetric Matrices"
Dita Choudhury, Loyola College

Maryland 301 — "Some Crisis Points in Teaching a Course in Abstract Algebra"
G. Edgar Parker, James Madison University

Maryland 313 — "Lancaster's Square Law in Discrete Variables"
MIDN 2/C Chris Cook and MIDN 2/C Erik Ruttenburg, U. S. Naval Academy.

Maryland 400 (One Hour) — "Mathematical Applications in Automated Cartography -- Triangulations in the Plane: An Example of Methods & Theory of Computational Geometry"
Alan Saalfeld, Statistical Research Division, Bureau of the Census.

SESSION BEGINNING AT 2:30 P M

300 Maryland Hall — "A Mathematical Model for Risk Assessment"
Donald R. Peeples, Mary Washington College.

301 Maryland Hall — "Teaching Differential Equations without Linear Algebra"
Philip E. Luft, Salisbury State College.

313 Maryland Hall — "Generalized Hardy Inequality"
Parviz Khajeh-Khalili, Christopher Newport College.

314 Maryland Hall — "Analyzing Liver Tumor Data"
Christopher Morrell, Loyola College

INVITED SPEAKERS: Harold B. Reiter is an Associate Professor of Mathematics at the University of North Carolina, Charlotte. He has earned degrees in mathematics from Louisiana State University and from Clemson University. His Ph. D. (1969) was directed by Andrew Sobczyk. In addition to experience at UNC-Charlotte, he has taught at the University of Hiwaii and at the University of Maryland where he served as Associate Chairman for Education, Department of Computer Science.

Dr. Reiter is a prolific reviewer, writer, and expositor. He has been appointed as editor of the Puzzles and Games Section of the new AFIPS magazine Computer Adventur. He serves on the MAA Committee on High School Contests 1984-87.

ABSTRACT - "Snapshots in Mathematical Decision Making" by Harold Reiter. A short sequence of mostly unrelated vignettes in mathematical modeling. Examples involving two person games, utility theory, auctions and multiperson games will be included as time permits. Audience participation is encouraged.

Paul K. Stockmeyer is an Associate Professor of Computer Science at the College of William and Mary. He earned his A. B. Degree at Earlham College and his M. A. and Ph. D. (1971) at the University of Michigan. His dissertation advisor was F. Harary. Dr. Stockmeyer's first appointment at William and Mary was in 1971 in the Department of Mathematics.

His research interests include analysis of algorithms, combinatorial enumeration, various topics in graph theory - particularly the reconstruction conjecture. He has published in a variety of journals of combinatorial mathematics and computer science.

ABSTRACT - "Is Discretion the Better Part of Mathematics?" by Paul K. Stockmeyer. Discrete mathematics has received a great deal of attention in recent years, in the MAA as well as other organizations. Motivated partially by the rapid growth in computer science, many mathematics educators have been busy trying to restructure the mathematics curriculum at the early college level, incorporating various discrete topics of use to a wide variety of students.

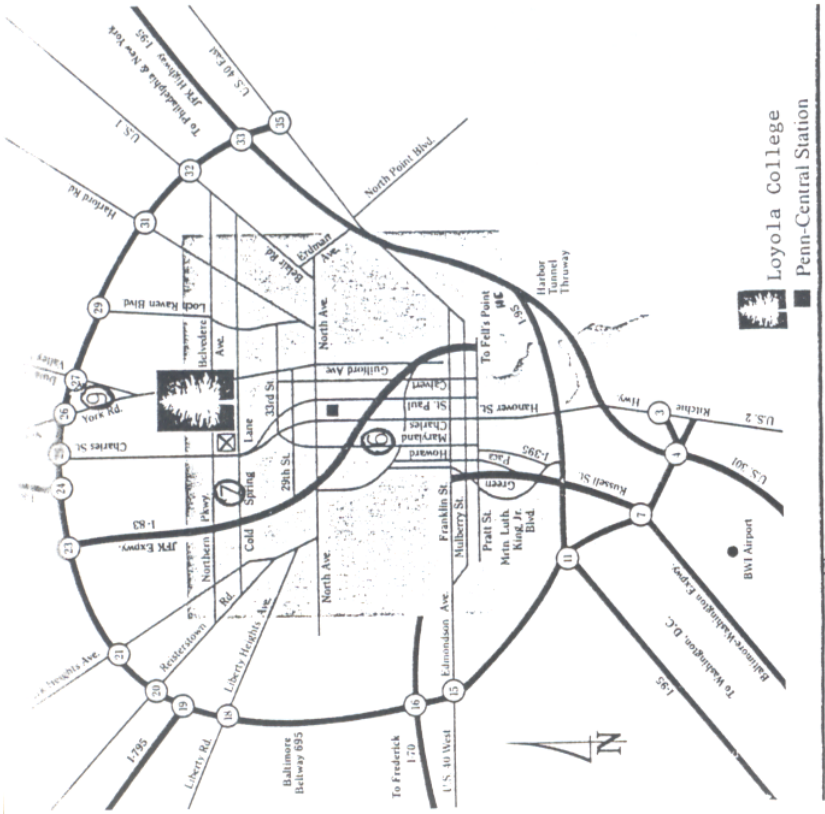
This address will attempt to illustrate several facets of discrete mathematics by examining various aspects of the change-making problem: given a sequence

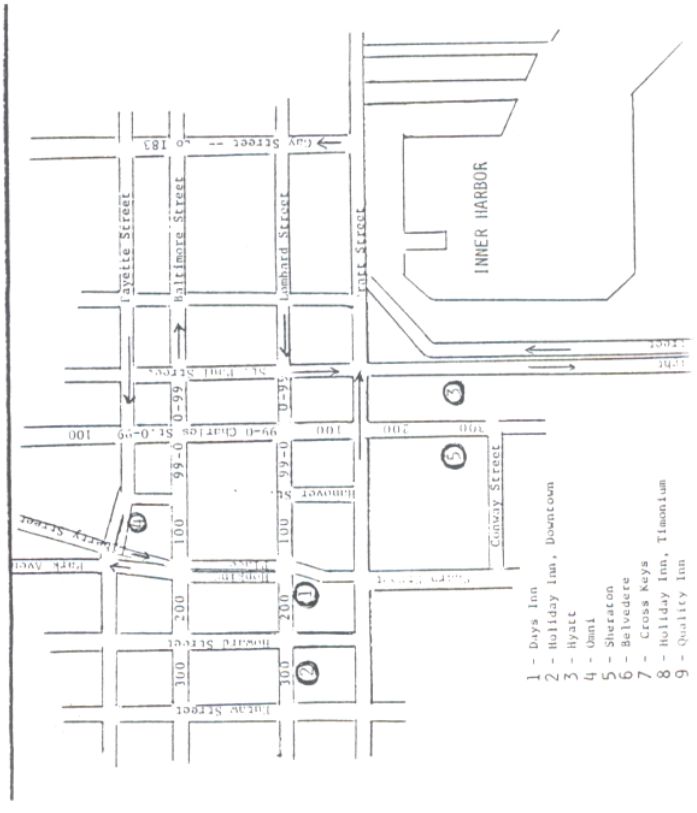
$$1 = a[1] < a[2] < a[3] < \ldots < a[n]$$

of coin denominations and a desired value y, how can one find a smallest possible collection of coins with a total value y? With the current American coinage system, a "greedy" algorithm will generate such a smallest collection of coins for all values of y. For other coin sequences, more sophisticated methods are needed. To date, there is no completely satisfactory method for determining which coinage sequences have this greedy property. Partial results will be presented, along with methods that find a minimum set when the greedy algorithm fails to do so. Questions about best possible coinage sequences will also be discussed.

LOYOLA COLLEGE IN MARYLAND
Campus Map

1. **President's House**
2. **Jesuit Residence**
   Campus Ministries
   Theology Department
3. **Jenkins Hall**
   Management/Marketing
   Psychology
4. **Xavier Hall**
   Accounting Department
   Economics/Decision Sciences
5. **Beatty Hall**
   Apple Computer Lab
   Career Planning and Placement
   Counseling Center
   Dean of Student Development
   Education Department
   Political Science Department
   Sociology Department
6. **Donnelly Science Center**
   Academic Computing Services
   Biology Department
   Chemistry Department
   Engineering Science/Computer Science/
   Physics Department
7. **Charleston Hall Apartments**
   First Financial Federal Credit Union
   Student Health Center
8. **Alumni Memorial Chapel**
9. **Cohn Hall**
   Executive Programs
   Finance Department
   Graduate Business Programs
10. **Maryland Hall**
    Academic Vice President/Provost
    Administrative Data Processing
    Advising Department
    Audio-Visual Services/Central Duplicating
    Business Office
    Communication Center
    Dean—College of Arts and Sciences
    Dean—Enrollment Management
    Dean—Sellinger School of Business
    and Management
    Finance and Administration Office
    Foreign Language and Literature
    Grants/Contract Services
    Institutional Research
    Mathematics Department
    Personnel
    Post Office
    Records Office
    Resource Management
11. **DeChiaro College Center**
    Athletic Department
    Campus Shop
    Emil G. "Lefty" Reitz Arena
    Swimming Pool
    Julio Fine Arts Wing
    Art Gallery
    English/Fine Arts Department
    History Department
    McManus Theater
    Philosophy Department
    Writing/Media Department
12. **John M. Curley, Jr. Athletic Field**
13. **Andrew White Student Center**
    Cafeteria
    Commuter Affairs
    Loyola Dining Service
    Saga Food Service
    Multi-purpose Room
    Student Activities
    Student Government
14. **Wells Fargo Gamefield**
15. **Hammerman House**
    Fava Chapel
16. **Butler Hall**
    Residence Life Office
17. **Loyola/Notre Dame Library**
18. **McAuley Hall**
19. **Ahern Hall**
20. **305 Rossiter Avenue**
    Military Science/ROTC
21. **Justin Ocher House**
    Publications
    Public Relations
22. **Early House**
    Military Science/ROTC
23. **302 Radnor Road**
    Military Science/ROTC
24. **300 Radnor Road**
    Phonathon Center
    ROTC/Military Science
25. **Service Building**
    Physical Plant
    Security
26. **Millbrook House**
    Admissions—Undergraduate
    and Graduate
    Alumni Relations
    Development
    Financial Aid
27. **Wynnewood Towers**
    Administrative Services
    Center for Professional Development
    Conference Services
    Facilities Coordination
    Speech Pathology and Audiology





Officers of the MD-DC-VA Section

Chairman	Robert Lewand, Goucher College
Chairman-Elect	Elizabeth Teles, Montgomery College (on leave, phone: (301) 262-9586)
Vice-Chairman, Programs	William Sanders, James Madison University
Vice-Chairman, Membership	John Milcetich, University of the District of Columbia
Secretary	Beverly Phillips, Thomas Nelson Community College
Treasurer	Ray Hancock, Emory & Henry College
Governor	Ben Fusaro, Salisbury State College
Summer Course Coordinator	Ben Fusaro, Salisbury State College
Regional Exam Coordinator	Sally S. Garber, Hollins College
Nominating Committee Chairman	Howard L. Penn, U. S. Naval Academy

Preregistration Form

Registration for the Fall Meeting [redacted] @ $ 2.00 $_____

Banquet reservation [redacted] @ 14.00 $_____

---------- Name

---------- Address

Send reservations to: Dr. Ray Hancock
Box Y
Emory and Henry College
Emory, Virginia 24327