



OHIO FOCUS

The Ohio Section Newsletter

Volume 6

Spring, 1998

Number 2

Soap Films and Minimal Surfaces at John Carroll, April 17-18



Frank Morgan with a soap film surface

The Department of Mathematics and Computer Science extends to you a warm welcome to John Carroll University for the spring meeting.

Frank Morgan will be the keynote speaker. He is well known for his innova-

Nominations for Section Officers

The Nominating Committee presents the following slate of candidates: Aparna Higgins (University of Dayton) for President-Elect, and Dale Mugler (University of Akron) for a three year term on the Program Committee. The elections will take place at the business meeting, Friday evening, April 17, 1998 at John Carroll. Nominations may be made from the floor.

The President-Elect subsequently serves as President, Past-President, and then on the Nominating Committee. The senior person on the Program Committee is chair.

tive and effective teaching style and his lectures on soap bubbles. In 1993, he earned one of the first MAA awards for distinguished teaching. Presently he is on leave from his position as chair at Williams College to accept a one-year Visiting Professorship for Distinguished Teaching from Princeton University. He has been very involved with undergraduate research projects. Program details on pages 8-9.

The Annual Business Meeting will be held Friday evening after the banquet. The agenda includes committee and officers' reports, election of officers, and the teaching award. We will then have dessert with students at the ice cream social.

For registration, maps, hotels, directions, see pages 10-11.

All of this, updated, is on the web.

Call for Contributed Papers

A contributed paper session is scheduled for Saturday morning. Papers on any topic in mathematics or related areas are encouraged.

Reports on projects, research announcements, or anything else you believe would be of interest to those in attendance are welcome. Reports of classroom innovations or interesting projects will be collected together for a session called *Teachers' Corner*.

Contributors for all sessions should send a title and a brief abstract by April 8 to: Prof. Judith Palagallo, Dept. of Mathematical Sciences, The Univ. of Akron, Akron, OH 44325-4002, email (preferred): Palagallo@uakron.edu. Fax: 330-374-8630.

The contributed paper program will be posted on the web page prior to the meeting.

Students are invited to attend

Some special activities which will be of interest to students are: (See pages 6,8,9.)

- "The Soap Bubble Geometry Contest" by Frank Morgan. Come early for this!
- Student talks on Friday afternoon.
- Student pizza party.
- Ice cream social after the pizza party.
- Invited talk "Bubbles and crystals in surfaces and in space" by Frank Morgan.
- Student micro-course: "A Mathematical Tour with the TI-92."

A call for student talks is on page 9. Students who need overnight accommodations can be housed with John Carroll University students (bring a sleeping bag). In order to plan for these events it is necessary that students who plan to attend send in the pre-registration form, see page 6 or the web.

Inside

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Governor's Report

The MAA Board of Governor's Meeting at the 1998 Annual Winter meeting in Baltimore was held on Tuesday, January 6 from 9:00 a.m. until about 4:00 p.m. A number of items were discussed that I would like you to be aware of, although most of these subjects are available elsewhere, particularly on the MAA website.

The Board approved the site for the 2002 Joint Winter Mathematics Meetings. They will be held in San Diego on January 6-9 of that year. Other meetings that were previously approved by the Board are San Antonio for January 13-16, 1999, Washington for January 19-22, 2000, and New Orleans for January 10-13, 2001. All of these meetings will be held, as traditional, with AMS, and SIAM will join us for the 2000 Joint Winter Meetings.

The only Summer MathFest currently scheduled is for this summer in Toronto, July 15-18. It will be held at Ryerson University in proximity to the SIAM meeting on the University of Toronto. The MathFest will overlay the SIAM meeting on two days, and there will be reciprocal registration for that period. Toronto is a wonderful location for a meeting and I encourage you to attend. For those of you with Celtic

music interest, Riverdance will be performing in the city during that month. We saw the show in London in 1996 and it is exceptional. No future Summer MathFests have as yet been scheduled, but the Board gave overwhelming support for a Summer 1999 Mathfest. I expected, and hoped, that the Board would have been asked to vote on a site for 1999 by the time you receive this Newsletter, but there are still meeting conflicts that need to be resolved. When I have the details of this meeting I will add them to my webpage report.

The MAA operating budget problems now appear to be resolved. These problems were due primarily to a revision of accounting procedures and the outsourcing of various services, but they have occupied the time of a number of the MAA Officers during the past 2 years, and disrupted the reporting procedures to the Board. A new Finance Director, Neil Beskin, has been hired, and the investment fund of the MAA has increased by nearly 20% this year. This increase in value exceeded the deficit in the operating budget for the year. There are two additional financial items that are important to the organization. The mortgage on the Headquarters building in Washington has been retired and that document was ceremonially burned at the Board of Governor's meeting. In addition, the MAA received over \$100,000 in contributions from members and friends this past year. I urge you to consider contributions to this important organization if your circumstances permit it.

In the year 2001, the International Mathematics Olympiad will be held in the United States and a Corporation has been set up to handle the many details associated with this contest. The officers of this Corporation who have thus far agreed to serve are Mel George-President, Anne Hudson-Vice President, and Ron Rosier-Secretary. As you likely know, the MAA oversees the Committee on the American Mathematics Competitions which administers the American Junior High School Mathematics Examination, the American High School Mathematics Examination, the American Invitational Examination, and the USA Mathematical Olympiad. The last three of these examinations determine which students will represent the USA in the International Mathematical Olympiad. An anonymous donor has recently made a bequest of approximately \$140,000 to support the awards program for students taking these examinations.

If you haven't done so recently, I encourage you to visit the MAA website at <http://www.maa.org>. There is a tremendous amount of interesting material at the site and it is changing constantly. In particular, take a look at the Columns and Reviews sections, which are the most popular.

I am including the Agenda for the meeting with the Web copy of this report. If you see anything on it that you would like me to discuss, please let me know.

Doug Faires,
Section Governor
fares@math.ysu.edu

President's Column

Attending the Baltimore MAA meetings this January reminded me of visiting the Cleveland Zoo with my first grade daughter several years ago. Before you draw some analogies between meeting attendees and zoo dwellers, let me hasten to explain the connection I saw.

Several years ago when my daughter Carla, who is now a college freshman, was in the first grade, a call for parents to accompany the first graders on their May trip to the zoo arrived at our home. My wife Susan noted that she had been on trips to several other destinations with Carla during the year, and this trip occurred after my final exams. I put my name on the paper to be returned to the first grade teacher with a feeling of martyrdom. I could envision me, the only male volunteer, trying to control a large number of first grade 'angels'. When the trip materialized, I was one of several dads in the group. So many adults had volunteered that I was one of the lucky parents to accompany the maximal number of first graders, two. All the way through elementary school for that class there were always many volunteers because everyone knew lots of others would also be there, sharing the load.

In one walk down the hall of the Baltimore Convention Center I surprised myself with the large proportion of the people I passed whom I knew. I was just reflecting that I knew them most of them because I had worked with them in some capacity, either with the national MAA high school contests or here in the Ohio Section. At the end of the hall I met Tom Hern, who reminded me it was time to start writing a new President's Column. I told him I had just gotten an idea for a topic!

The MAA in general and the Ohio Section in particular has very many members willing to contribute many hours of

OHIO FOCUS

The newsletter of the Ohio Section of the Mathematical Association of America, which first appeared in 1973, is published twice yearly in time to reach members before the fall and spring meetings.

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Deadline for next newsletter is

August 20, 1998

Email copy preferred.

This information will also be posted, and updated, on the Section web page. Access from MAA On-Line or at URL <http://www.bgsu.edu/departments/math/Ohio-section/>

work. That is why it is a pleasure and not a fearsome undertaking to volunteer for a job. It has been my pleasure to lead the Ohio Section this past year and become even more aware of all those contributing to our work:

- For junior high school and high school students keeping Ohio near the top in participation in the MAA contests and linking with the preservice and inservice education of their teachers;
- For our college students running an essay contest and student talks at our spring meetings and keeping all informed about changes in curriculum for these students;
- For the recognition and continuing professional development of our faculty putting serious work into selecting our annual teaching award recipient, running the Ohio NExT program and the summer short course, and providing informative programs and delightful arrangements for our semiannual Section meetings;
- For the public in general trying to get the word out about Mathematics Awareness Week and making our newsletter and homepage as up to date, attractive, and useful as possible.

I know from experience that it is during the weeks surrounding the spring meeting that the new president of the Section thinks most about the vacancies on committees that should be filled with new faces to get as many section members involved as possible. I know you will give Roger Marty, your new president after our spring meeting, all the cooperation you have given me. Please seek him out at our spring meeting to tell him you are willing to help us. You can be assured that there will be many sharing that work.

If next year is not your turn to work actively in the Ohio Section, then plan to participate in the many activities the Section runs for you. At the very least, attend our meetings and maybe even contribute a paper to share your mathematical ideas with your friends, new and/or old, in the Section: April 17-18 at John Carroll University near Cleveland in the northeast quadrant of the state; October 9-10 at Columbus State in Columbus in the center of the state; and next spring, March 26-27, 1999 at the University of Dayton in the southwest quadrant of the state. And don't forget our short course with Bill Dunham June 24-26 at Ashland.

Leo J. Schneider
Section President

Editor's Bits

A Quarter Century, and Moore

It finally occurred to me that 5 times 5 is twenty five. Each volume of this newsletter spans the 5 year term of the editor. We have just begun volume 6. That means that this newsletter has passed a milestone that should not go unnoticed: twenty five years of publication. The first issue appeared in January, 1973 under founding editor Will Hahn of Wittenberg. Although an early MAA section newsletter, and a continuing trend setter, it was not the first.

The contents have not changed much in that time, but the appearance has somewhat. Originally a 5.5 x 8.5 inch booklet, it became a full 8.5 x 11 inch page size when Dwight Olson of John Carroll became editor in 1992. That format continues. He also started using the name *Ohio Focus*. The Section logo was introduced by Dave Kullman of Miami in 1982. And the frequency of publication has been reduced to two issues per year from three.

Richard Little and Carol O'Dell have been the other editors who have maintained the quality and utility of this important resource over the years. Many thanks to all. I hope to keep up the tradition.

While I am on an historical tangent. I was doing some genealogical research when I came across a familiar name in a Woodward High School alumni association publication: the name was E.H. Moore. He was in the same class, 1879, as my great-grandparents. Woodward was in downtown Cincinnati at the time, and grew out of Woodward College. Moore grew up in Athens, Ohio and went on to get his Ph.D. at Yale. He established the department of mathematics at the University of Chicago in 1890s. Many famous names started there: L.E. Dickson, O. Veblen, R.L. Moore, G.D. Birkhoff. The book by Parshall and Rowe on the 1875-1900 era in the U.S. is fascinating.

The latest to come to my attention is that in the twenties Arnold Ross, who was chair at OSU when I was there, studied at Chicago, and Moore was his undergraduate advisor, "considered the American progenitor of the discovery method of teaching." (Not R.L. Moore, as you might think.)

My great-great-grandfather, an 1856 graduate of Allegheny College, taught physics and chemistry at old Woodward from 1860 to 1895. He no doubt taught these subjects to Eliakim Hastings Moore.

Thomas Hern
Newsletter Editor

OhioNExT

The Ohio Section's local version of the national Project NExT for new faculty members is one year old. There are now twenty-eight OhioNExT fellows. Of these, fifteen are also national NExT fellows. To be eligible, the only requirements are that a faculty member be in her/his first four years of teaching and have a strong commitment to teaching undergraduates. Applications for new OhioNExT fellows are now being accepted. Details and application materials can be found on the Section web page, or from Barbara Ashton (Wittenberg). The Ohio Section recently learned that we have received a three thousand dollar grant from national NExT funds which were dedicated to start-up costs for state NExT programs. The application that we made for NSF support, however, was not funded.

Special OhioNExT workshops have been held on the Thursday evening and Friday morning prior to each of the last two Ohio Section meetings, the first at Youngstown State and the second at Shawnee State. Both times, workshop activities got underway with a banquet on Thursday evening, followed by a lively discussion about issues related to teaching and professional development. Friday morning workshop sessions at Youngstown State were presented by Fred Rickey (Bowling Green), who spoke about incorporating the history of mathematics into regular courses, and by David Flaspohler (Xavier), who offered advice about grant writing. Friday morning workshop sessions at Shawnee State were presented by Aparna Higgins (Dayton), who related her experiences in leading undergraduate research, and by Judy Holdener (Kenyon), who offered insights into designing innovative computer projects to integrate into coursework. Also, at each of the workshops, several of the OhioNExT fellows have presented short talks about their mathematical research.

We have planned another full program of NExT workshop activities for Thursday evening and Friday morning, April 16 and 17, preceding the Ohio Section spring meeting at John Carroll. Fellows will be housed on Thursday night at the Travelodge Beachwood (at Section expense), and the banquet will be held at 7:00 p.m. in the Faculty Dining Room on campus. Friday morning, after a breakfast in the President's Dining Room on campus,

(continued on page 5)

1997-98 Ohio Section Officers and Committees

ELECTED OFFICERS

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Roger Marty, Cleveland State
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Past-President

Barbara Ashton, Wittenberg
937-327-7860, ashton@wittenberg.edu

Section Governor

Douglas Faires, Youngstown State
330-742-1805, faires@math.yzu.edu

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COMMITTEES

• denotes committee chair. The elected officers and these committee chairs are the voting members of the Executive Committee. Terms expire at the end of the Spring meeting. See the Bylaws.

Program Committee:

Judith Palagallo• Akron 1998
330-972-7402, palagallo@uakron.edu
Harold Putt Ohio Northern 1999
Thomas Gantner Dayton 2000

Committee on Curriculum (CONCUR)

Anne Albert• Findlay 1998
419-424-4543, albert@lucy.findlay.edu
Robert Hovis Ohio Northern 1999
Daniel Otero Xavier 1998
Carol Schumacher Kenyon 2000
Carl Spitznagel John Carroll 2000
Olaf Stackelberg Kent State 1999
Thomas Willke Otterbein 1998

Committee on Section Activities (CONSACT)

Thomas Dence• Ashland 2000
419-289-5262, tdence@ashland.edu
Teresa Bright Xavier 1999
Bob Dieffenbach Miami Middltn 2000
Jim Dillon Mt Union 1998
William Higgins Wittenberg 1998
Darrell Horwath John Carroll 2000
Renee Koplou Wright State 1999

Committee on Student Members (CONSTUM)

Sherri Brugh• Mt Union 1998
330-823-3561, brughsl@muc.edu
Curtis Bennett Bowling Green 1998
David Calvis Baldwin Wallace 1998
Diane Groth Findlay 1999
Barbara D'Ambrosia John Carroll 2000
Brian Shelburne Wittenberg 1999
Gordon Swain Ashland 2000

Committee on Teacher Education and Certification (CONTEAC)

James Sellers• Cedarville 1998
513-766-7695
SELLERSJ@cedarville.edu
David Flaspohler Xavier 1999
Phil Huneke Ohio State 2000
Richard Laatsch Miami 1999
Delene Perley Walsh 1998
Sherwood Silliman Cleveland State 2000
Donald Story Akron 1998

OTHER COMMITTEES

* denotes committee chair.

Nominating Committee:

John Michel* Marietta 2000
614-376-4819
michel@mcnet.marietta.edu

Floyd Barger Youngstown 1999
Thomas Hern Bowling Green 1998

Committee on Contests:

Bill Higgins Wittenberg AJHSME
David Stenson John Carroll AHSME

ByLaws Committee

Darrell Horwath* John Carroll
216-397-4685, djh@jcvaxa.jcu.edu
J. William Friel Dayton

Teaching Award Committee

Barbara Ashton* Wittenberg
Janet Roll Findlay
Douglas Faires Youngstown
John Lancaster Marshall

Local arrangements for meetings:

Spring, 1998: John Carroll, Cleveland
Darrell Horwath, 216-397-4685,
djh@jcvaxa.jcu.edu

Fall 1998: Columbus State [Joint with
OhioMATYC]

Larry Lance,
llance@cougar.colstate.cc.oh.us

Spring 1999: Dayton

J. William Friel, 513-229-2511,
friel@saber.udayton.edu

Fall 1999: Wooster

Charles Hampton, 330-263-2486,
hampton@acs.wooster.edu

Fall 2000: Wittenberg

Brian Shelburne

(Ohio NExT continued)

the room will be configured in seminar format for workshop activities. Leading off will be short talks by three fellows on their research activities. Speaking will be Barbara Margolius (Cleveland State), Preston Nichols (Wittenberg), and Maria Walters (Ohio Northern). Following the short talks, there will be two major workshop sessions. The first workshop session will be presented by Milt Cox (Miami) on nurturing good teaching and evaluation of teaching. Milt is a former president of the Ohio Section. He is University Director for Teaching Effectiveness Programs at Miami; and nationally, Director of the Lilly Conference on College Teaching, and Editor in Chief of the *Journal on Excellence in College Teaching*. The second workshop session will be on retention of women and minorities in mathematics. (More details about the program will appear on the Section web page as they become available.)

John Michel

Preview of Fall and Spring Meetings

The Fall 1998 meeting is scheduled for October 9 -10, 1998 at Columbus State Community College. Larry Lance of Columbus State is in charge of local arrangements. This will be a joint meeting with OhioMATYC. Dr. David Stone of Georgia Southern University has tentatively agreed to be the invited speaker for the meeting. Dr. Stone is the chair of the MAA Committee on Sections. He was recommended by Section Governor Doug Faires.

The Spring 1999 meeting will be held at the University of Dayton on March 26 -27. The tentative theme for this meeting is "Mathematics in Industry". Dr. Ronald Graham of AT&T Research has agreed to be the featured speaker. As usual the spring meeting will include student papers as well as faculty contributed paper sessions. We are excited about giving our students the opportunity to see and hear Dr. Graham.

Preliminary editions of the programs for each of these meetings will appear on the web page soon. These programs will be updated as details of the meetings are finalized.

Harold L. Putt

Dept. of Mathematics and C. S.
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h-putt@onu.edu
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Campus News

Bowling Green State University

Fred Rickey has accepted a position at the U.S. Military Academy at West Point, taking advantage of the Early Retirement Incentive Program (ERIP).

William Speer, mathematics education, has accepted a full professorship in the College of Education at UNLV, where he has held a visiting position for two years since taking ERIP.

Jiahua Chen is a visitor spring semester from the Department of Statistics and Actuarial Science at the University of Waterloo. He is conducting a seminar on empirical likelihood methods.

College of Mount Saint Joseph

Dr. Michael Stoecker is the new Chair of the Department of Mathematics and Computer Science. Dr. Mary Ann Haubner, previous and long time Chair, continues to assist in the transition while on sabbatical during the 97-98 academic year.

College of Wooster

Reuben Settergren has joined the Mathematical Sciences Dept. He earned a Ph.D. in Operations Research at Rutgers in 1997 and will be teaching mathematics and computer science courses.

Kent State University

Paul Farrell has been promoted to Full Professor.

New faculty: Javed Khan (U. Hawaii), Networking and parallel computing, Mark Lewis (U. Wisconsin) Group Theory, Laura Smithies (Utah) Lie Group Representations, Tet Ueda (Northwestern) Applied Math., Bob Walker (Carnegie-Mellon) Assoc. Prof., Computer Architecture.

Visitors: Vladimir Gurariy, Adjunct Professor; Analysis; Janos Ludwik, Adjunct Professor; Topology; Angela Spalsbury, Witwatersrand, S. Africa; Analysis; Johan Swart, Pretoria, S. Africa; Analysis; Yuan Tian, Royal Institute of Technology, Stockholm, Analysis; Vilmar Trevisan, UFRGS, Brazil, Computer Algebra; Anthony Weston, Pretoria, S. Africa, Analysis.

Miami University

While on a faculty improvement leave in the fall semester, Robert S. Smith was a visiting scholar at the Miami University Dolibois European Center in Differdange, Luxembourg.

Ohio State University

Frank Carroll is on leave until June at Christopher Newport University, Newport News, VA. Arnold Ross, chair from 1963 to 1976, received the *Citation for Public Service* from the AMS at the Baltimore meetings in January for "inspiring generations of young people through the summer mathematics programs he created and has continued to run for nearly 40 years."

Wittenberg University

Preston Nichols has joined the faculty as a Visiting Assistant Professor, coming most recently from our NCAC rival Allegheny College. He is an Ohio-NExT fellow, and his Ph.D. is in differential geometry from the University of Minnesota.

Barbara Ashton and Doug Andrews have returned after being on sabbatical leave fall semester.

Miami Conference

The 26th Annual Mathematics and Statistics Conference will be held October 2-3, 1998. The theme will be "Classroom Models, Demonstrations, and Constructions."

Anyone with ideas about concrete models, interesting problems, student projects, or demonstrations appropriate for a college-level mathematics or statistics classroom is invited to contribute a paper. Send a title and brief abstract by June 15, to: Prof. Mark Smith, Dept. of Mathematics and Statistics, Miami Univ., Oxford, OH 45056, Fax: 513-529-1493, e-mail: masmith@miamiu.muohio.edu

The University of Akron

Antonio Quesada, Professor of Mathematics, recently received a renewal of a three-year grant (\$250,000) from the Knight Foundation to support collaboration between UA and the Akron Public Schools. The goal of the grant, one of ten nationwide, is to improve mathematics instruction and raise the skills of students in the classrooms so they will be better prepared for college and/or the workplace.

The study focuses on the implementation of an integrated curriculum based on the NCTM standards for grades six to ten.

(continued →)

STUDENT REGISTRATION FORM

Two NSF curricula, Six Through Eight Mathematics (STEM) and the Core-Plus Mathematics Project are being used. The method of teaching involves an integrated approach to mathematics that is supported by technology, taught in an active, hands-on setting and is assessed using a variety of methods. In the second phase of the project, the investigators will analyze students' performance on the 4th, 6th and 9th Olin Proficiency Tests.

Logo Contest

The Committee on Student Members (CONSTUM) would like to announce a logo contest. Beginning this year, we will award a free T-shirt to any student entering the student paper contest. This year, the T-shirt will have the Ohio Section MAA logo on it. For next year's contest, we would like to give away T-shirts with a logo designed by a faculty member or student from an institution in the Ohio section. The only restriction on the logo is that it should incorporate some aspect of mathematics. Logos should be sent so as to be received by September 30, 1998 to: Gordon Swain, Dept. of Mathematics and C. S., Ashland University, Ashland, OH 44805.

The winner of the logo contest will receive a free T-shirt and will have the opportunity to see his or her artwork on display at the Spring meeting where T-shirts will be on sale.

A copy of this form must be returned by all undergraduate students who plan to attend the meeting, including those who are presenting papers. This form may also be found on the web page.

Name: _____

School: _____

Address: _____

City: _____ State: _____ Zip: _____

E-mail: _____ Phone: _____

Attending pizza party..... Yes _____ No _____

Micro-course..... Yes _____ No _____ Maybe _____

Need overnight accomodations.... Yes _____ No _____

If Yes, indicate gender..... Female _____ Male _____

Bring your own sleeping bag.

Note: here is no charge to students for any of the above activities.

Mail this form to: Dr. Barbara D'Ambrosia, Department of Mathematics and Computer Science, John Carroll University, Cleveland, OH 44118

Or send e-mail with the above information to bdambrosia@jcvaxa.jcu.edu.

Deadline for receipt of registration is April 14.

SHORT COURSE REGISTRATION FORM

Name _____ Nickname (for badge) _____

Institution _____ email _____

Mailing Address _____ Telephone (home) _____

_____ (office) _____

Lodging _____ Will stay at an area motel (Information available on request.)

_____ Request dormitory room (not air conditioned).

_____ Single (\$15 per night) _____ Double (\$10 per person per night) _____ Male _____ Female

_____ Tuesday, _____ Wednesday, _____ Thursday, _____ Friday

_____ Please check if you wish to attend the Thursday evening banquet (Amish family style at Der Dutchman). \$16

A \$50 deposit is required. Checks should be made payable to "Ashland University" and should be marked "Summer Short Course". Send to: Katherine Watson, Dept. of Mathematics And Comp. Sci, Ashland University, Ashland OH 44805, phone: (419) 289-5790

A Mathematical Sampler: 1699-1900

William Dunham, Muhlenberg College, PA
June 24-26, 1998
Ashland University

This workshop examines a collection of mathematical landmarks from the middle of the seventeenth through the end of the nineteenth centuries. The theorems are the original work of such towering figures as Newton, the Bernoulli brothers, Euler, Gauss, and Cantor and come from the fields of analysis, number theory, algebra, geometry, and the theory of sets. They give historical perspective to topics encountered in college mathematics, and many can be transferred intact to the undergraduate classroom. Most importantly, these theorems represent the beauty and brilliance of mathematics at its best.

The topics to be considered are:

- Newton's Method in its original form (1669)
- The Bernoullis' divergence proofs for the harmonic series (1689)
- Euler's evaluation of $\sum 1/k^2$ and related series (1734)
- Euler's number theory, especially his work on even perfect numbers (1747)
- Euler's clever but flawed attempt to prove the fundamental theorem of algebra (1749)
- Gauss' construction of the regular 17-gon (1796)
- Pathological functions of Dirichlet (1829), Riemann (1854), and Weierstrass (1872)
- Cantor's first proof of the non-denumerability of the continuum (1874)
- Volterra's proof that no real function can be continuous precisely on the rationals (1881)
- Baire and his "category theorem" (1899).

The workshop meets from 9:00 am - 4:30 pm on Wednesday, June 24 and Thursday, June 25, and from 9:00 am - noon on Friday, June 26. Sessions are informal with discussion encouraged, and problem sets will be provided for possible use in courses elsewhere. Participants will have access to the original papers/books in which these great theorems appear.

Biographical Sketch

Bill Dunham received his B.S. from the University of Pittsburgh and M.S. and Ph.D. (1974) from Ohio State. He is the Truman Koehler Professor of Mathematics at Muhlenberg College. Although trained in general topology, Bill's interests soon shifted to the history of mathematics. He received grants from the National Endowment for the Humanities to direct summer seminars on math history at Ohio State, and he has spoken on historical topics at national and regional mathematics meetings as well as at the Smithsonian Institution, on NPR's "Talk of the Nation/Science Friday", and on the BBC.

His expository writing was recognized with the MAA's George Polya Award in 1991 and the MAA's Trevor Evans Award in 1997, and he received the *Award for Distinguished College or University Teaching of Mathematics* from the MAA's Eastern Pennsylvania and Delaware section in 1994. Dunham combined his historical and mathematical interests by authoring *Journey Through Genius: The Great Theorems of Mathematics* (John Wiley, 1990). A second book, *The Mathematical Universe* (John Wiley, 1994) received the American Association of Publishers' award as the Best Mathematics Book of 1994.

Expenses

The registration fee is \$100. Dormitory rooms are available at a daily cost of \$15 (single) or \$10 (half a double.) Nearby motel rooms are available. A Thursday evening banquet at Der Dutchman restaurant (Amish family style) will cost \$16.

Area Attractions

Pro Football Hall of Fame, Sea World, Cleveland Indians baseball, Rock & Roll Hall of Fame, Blossom Music Center, Cedar Point Amusement Park, Lake Erie islands, Thomas Edison birthplace, Mohican State Park, and many fine golf courses.

Registration:

Form is on page 6, and on the web. A \$50 deposit is required. Registration begins April 1 and closes May 1, or sooner if 40 deposits are received

Additional details: Contact Dr. Thomas Dence, Dept. of Mathematics and CS, Ashland University, Ashland, Ohio, 44805. (419)-289-5262. Email: tdence@ashland.edu.

Updates will be posted on the web page. Please display this poster.

Spring Section Meeting Program

April 17-18, 1998

All sessions are open to all registrants.

Friday

Noon-4:30 Registration
12:15-1:15 Committee Meetings
CONSTUM, CONSACT, CONCUR, CONTEAC
Program Committee
12:30-5:00 Book Exhibits
1:30-1:45 Welcome, Announcements
1:45-2:45 **Invited Address:**
"The Soap Bubble Geometry Contest"
Frank Morgan
Williams College and Princeton University
2:45-3:10 Coffee Break
3:15-4:15 **Address:**
"An Escher Version of the Banach-Tarski
Paradox"
Curtis D. Bennett, Bowling Green State Univ.
4:30-6:00 **Student Talks**
4:30-5:30 Executive Committee
6:30-8:00 Banquet, cash bar.
6:30-8:00 Student Pizza Party
8:00-8:45 Annual Business Meeting
8:45 Ice Cream Social

Saturday Morning

8:00-10:00 Registration
Book Exhibits
8:00-8:50 Coffee and Donuts
Department Chairs and Liaisons Meeting
Executive Committee
9:00-9:50 **Invited address:**
"Bubbles and Crystals in Surfaces and in Space"
Frank Morgan
9:50-10:10 Coffee break
10:00-12:00 **Student Microcourse:**
"A Mathematical Tour with the TI-92"
Penny Dunham
Muhlenberg College
10:15-11:45 **Contributed Papers**
12:00-12:50 **Retiring President's Address:**
"A Funny Thing Happened on the Way to the
Formula."
Leo J. Schneider
John Carroll University
12:50 Closing Remarks

Check the web for updates (<http://www.bgsu.edu/departments/math/Ohio-section/>).

Keynote talks by Frank Morgan

The Soap Bubble Geometry Contest

A guessing contest. Demonstrations, explanations, news, prizes.

Bubbles and Crystals in Surfaces and in Space.

Thousands of years after Zenodorus proved that a planar soap bubble should be round, mathematicians are still stumped by optimal shapes in nature and in geometry.

Frank Morgan

Frank Morgan works in minimal surfaces and studies the behavior and structure of minimizers in various dimensions and settings. His three texts all have current new editions: *Geometric Measure Theory: a Beginner's Guide* 1995, *Calculus Lite* 1997, and *Riemannian Geometry: a Beginner's Guide*, 1998.

Morgan went to MIT and Princeton, where his thesis advisor, Fred Almgren, introduced him to minimal surfaces. He then taught for ten years at MIT, where he served for three years as Undergraduate Mathematics Chairman, received the Everett Moore Baker Award for excellence in undergraduate teaching, and held the Cecil and Ida Green Career Development

Chair. He spent leave years at Rice, Stanford, and the Institute for Advanced Study. He served on the NSF Math Advisory Committee from 1987-90, on the AMS Council from 1994-97, and as chair of the Hudson River Undergraduate Mathematics Conference in 1997. In January, 1993, he received one of the first MAA national awards for distinguished teaching. In 1995 he represented mathematics research at the exhibition for Congress by the Coalition for National Science Funding. He received the Allen High School Distinguished Alumni Award and an honorary doctorate from Cedar Crest College.

For several years Morgan served at Williams as Mathematics Department Chair and founding director of an NSF undergraduate research project. Work of his undergraduate Geometry Group is featured in the 1994 AMS *What's Happening in the Mathematical Sciences*. He has recently been named as Dennis Meenan Third Century Professor of Mathematics.

Morgan has a weekly live call-in Math Chat on local cable TV, featured in Ivars Peterson's column *MathLand*, and a bi-weekly Math Chat column in *The Christian Science Monitor*, both available via his web page at www.williams.edu/Mathematics/fmorgan. For 1997-98 he holds the new

Visiting Professorship for Distinguished Teaching at Princeton University.

A Funny Thing Happened on the Way to the Formula

Leo J. Schneider

When we meet former students, our majors tell us about all the interesting mathematics and applications with which they have been involved since they graduated; non-technical former students who took our course only to satisfy some college requirement seem to remember us for some comment we made off the subject that we have long ago forgotten. "Stories" that can help our students remember some of the mathematics in those lower division mathematics courses they are required to take might help us reach some more of our students. Even our courses for our majors can be enlivened with "stories." Examples of both types will be provided, including one that I regularly use that will explain the nature of this abstract.

If our students don't remember every subtle nuance in the mathematics we teach, wouldn't it at least be nice if they could be overheard talking about our course and saying, "A Funny Thing Happened on the Way to the Formula!"

An Escher Version of the Banach-Tarski Paradox

Curtis D. Bennett

Curt has been at BGSU since 1993, where he is now an Associate Professor, having previously been at Ohio State and Michigan State. He has been instrumental in building the department's Putnam team, and is a self-confessed puzzle freak. He earned his Ph.D. in algebra from the University of Chicago in 1990, working under George Glauberman. He grew up in Colorado where his father taught veterinary medicine at Colorado State.

Abstract

In discussions at a 1993 Ohio Section meeting, Stan Wagon posed the problem of exhibiting Hausdorff's Half-Third paradox on Escher's Circle Limit IV woodcut. We show pictures, generated by *Mathematica*, (<http://www-math.bgsu.edu/~cbennet/>) that exhibit the Half-Third paradox of hyperbolic space. We also discuss the computer implementation. In the first picture, one color is one third of the picture, whereas in the second picture it is half of the picture. However, the only difference between the two coloring schemes is that the center of the hyperbolic plane has moved.

If one thinks of that color as a visualization of the "choice set", this provides a new and artistic way of looking at the Banach-Tarski paradox: colloquially, that a ball can be cut up into finitely many pieces that can be reassembled into a ball twice its original size.

Student Micro-Course

A Mathematical Tour with the TI-92

Penny Dunham
Muhlenberg College

We know that the graphing and numerical features of calculators can enhance beginning mathematics courses, but what about the upper end of the spectrum? Can math majors use graphing calculators in upper level courses? The answer is "Yes!". The symbolic capabilities of the TI-92 graphing calculator make it an ideal tool for exploring topics in more advanced courses.

In this workshop, students will use the TI-92 calculator to generate examples, counterexamples, and even proofs, as we tour topics from differential equations, linear algebra, advanced calculus, number theory, geometry, and abstract algebra. (Calculators will be provided.)

Call for Student Talks

Students are encouraged to give a 15-minute presentation at the Spring Meeting. Topics may be drawn from any area of mathematics or a related discipline. The presentation may be an expository talk, a recounting of a mathematical internship or co-op experience, or the results of a research project.

Each student speaker will receive a free one-year MAA membership. Student talks are an integral part of the meeting, providing exciting and rewarding experiences for all who participate. Professors are asked to encourage their students to give a talk!! Two trophies will be awarded to the institutions sponsoring the most student talks. One trophy will be awarded to a school with an undergraduate enrollment of more than 10,000, and the other trophy will be awarded to a school with an undergraduate enrollment of less than 10,000. The host institution is not eligible to receive a trophy.

Abstracts for student papers should be sent (e-mail is especially encouraged: bdambrosia@jcvaxa.jcu.edu) so as to be received by April 8, 1998, to: Barbara D'Ambrosia, Dept. of Mathematics and CS, John Carroll U., University Heights, OH 44118. Please include a mailing address so that your MAA membership can be sent to you.

Banquet

Choice of entree: Beef Brisket or Chicken Marsala. (Please indicate your choice on the registration form.) Whipped potatoes, green beans almondine, tossed salad. Preceded by a cash bar. Dessert at the Ice Cream Social.

Parking

Parking on campus will be scarce prior to about 1:00 on Friday. If you will not be attending committee meetings, you may do well to plan your arrival for after 1:00.

If you preregister, we can send you a parking permit in the mail. (See Registration Form.) Otherwise, you can simply stop at the guard house by the entrance to campus and pick up a visitor permit. (If there is no guard on duty, don't worry about the permit, since it is really not that necessary.) Park in either of the lots marked on the campus map. There is no charge.

You may be able to find on-street parking within several blocks of campus. If you have to resort to this, please be sure to look for signs restricting parking times, as the local police are vigilant about ticketing illegally parked cars.

Campus Profile

John Carroll University is one of 28 colleges and universities operated in the United States by the Society of Jesus. It was founded as St. Ignatius College in 1886 and has been in continuous operation as a degree-granting institution since that time. In 1923 it was renamed John Carroll University, after the first archbishop of the Catholic Church in the United States. In 1935 it was moved from its original location on the West Side of Cleveland to its present site in University Heights. Originally an all-male institution, it became fully coeducational in 1968.

A faculty of approximately 250 maintains the university's three major academic divisions: College of Arts and Sciences, School of Business and Graduate School. Enrollment ranges from 3800 to 4200. The Department of Mathematics and Computer Science offers three undergraduate degrees: a Bachelor of Science in mathematics, a Bachelor of Science in computer science and a Bachelor of Arts in teaching mathematics; and two graduate degrees: a Master of Science in mathematics and a Master of Arts in mathematics, the latter designed for secondary mathematics teachers. It also offers minors in mathematics, computer science and probability and an interdisciplinary concentration in economics and mathematics. The B. S. in mathematics requires the traditional three semester calculus sequence, a course in computer programming, introductory courses in modern algebra, linear algebra and probability, courses in advanced calculus, abstract algebra and topology and five elective courses in pure or applied mathematics. This past year the department graduated 22 majors and 7 graduate students.

The department consists of 16 full-time members, 5 part-time, and 7 graduate assistants. In addition to the traditional roles in teaching (all members place primary emphasis on teaching) and research (10 have reduced loads for research) the department plays an active role in supporting mathematics education at all levels. David Stenson is the Ohio coordinator for the AHSME, and Leo Schneider and Dick Horwath are members of the Advisory Panel for the American Mathematics Competitions. The department sponsors a mathematics competition for Cleveland Public School students, now in its twelfth year. It has also sponsored a speakers bureau since 1980 and averages 40 visits yearly to high schools.

Where to Stay

Hotels #1– #4 are located just off I-271 at exit 29 (Chagrin Boulevard) in Beachwood. See map below. This hotel area is also marked on the other maps. The distance to JCU is about 4 miles. Allow 10-15 minutes driving time.

Alternatively, hotel #5 is just off the I-271, Mayfield Road exit (two exits north of exit 29), and is marked on the area map. Driving time to JCU from this hotel is 20-25 minutes.

Please make your reservations directly with the hotel/motel. In order to get the rates quoted below, be sure to mention that you will be attending the Mathematics Meeting at John Carroll University (except for the Budgetel, which are regular rates).

1. Radisson Inn Beachwood

26300 Chagrin Blvd., (216) 831-0627
 \$85 single or double
 (15 rooms being held until March 17)

2. Cleveland Marriott East

3663 Park East Dr., (216) 464-5950
 \$74 single or double

3. Holiday Inn Beachwood

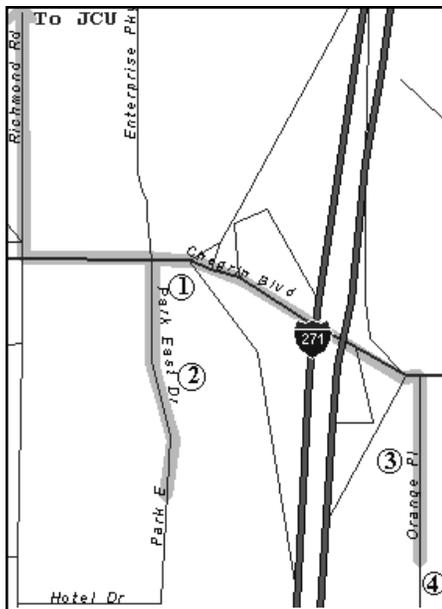
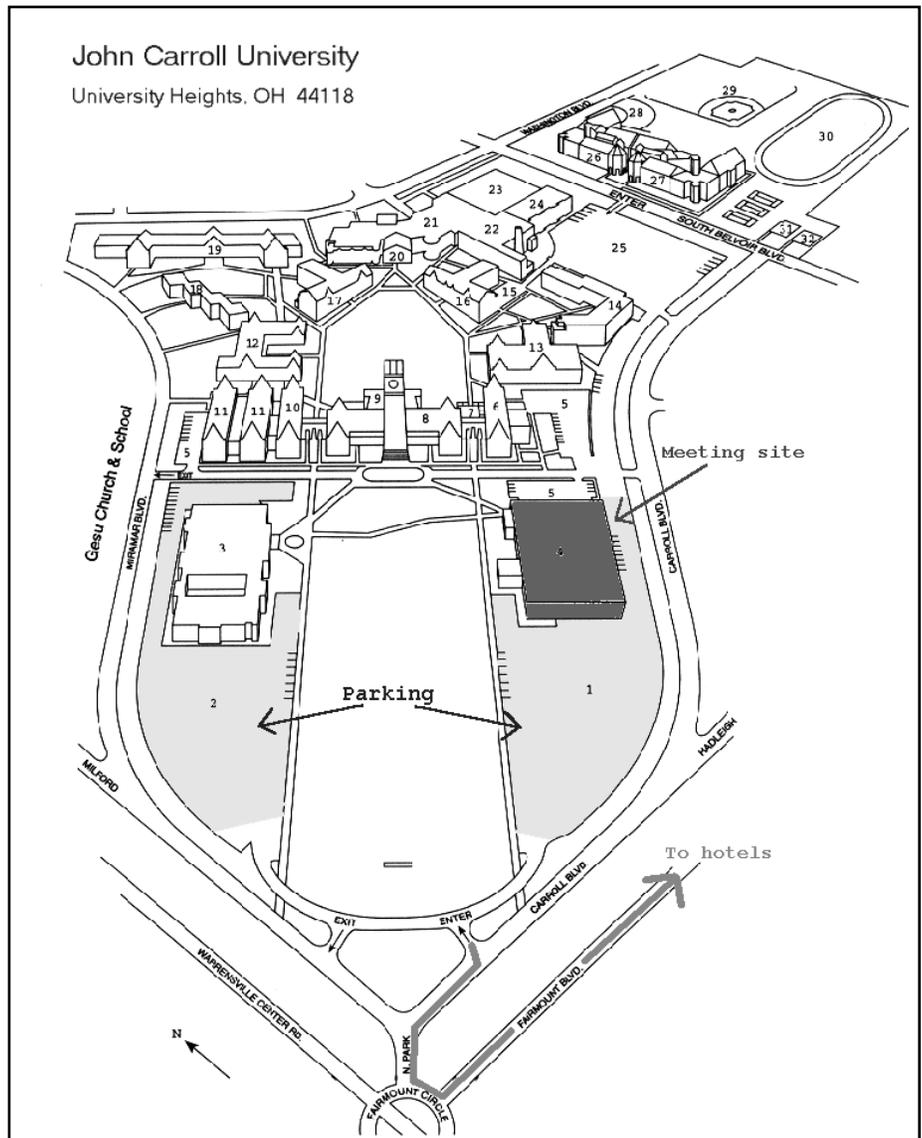
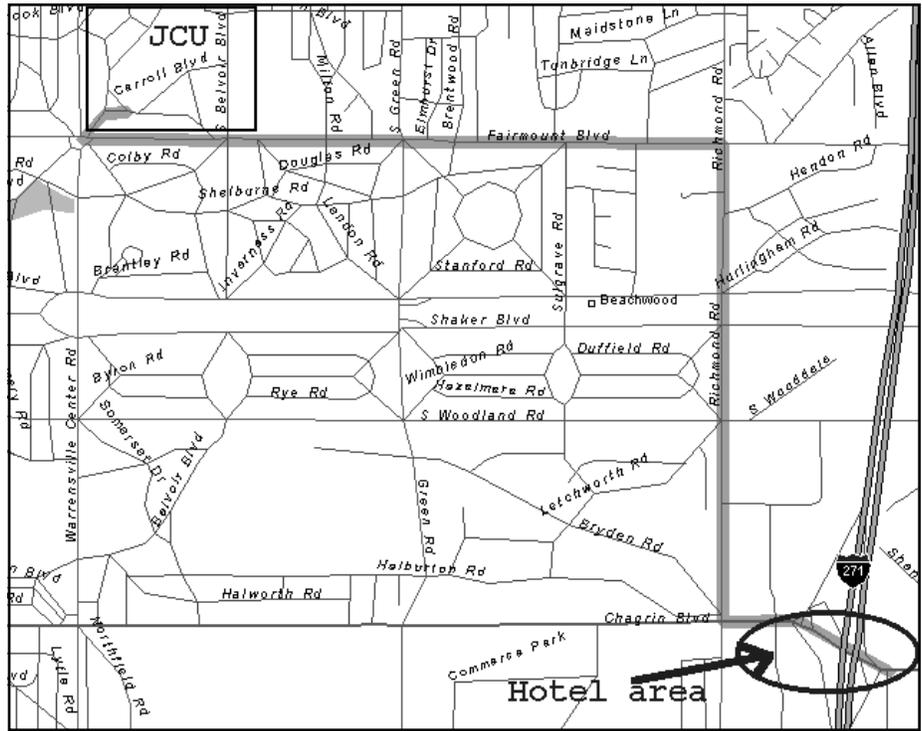
Orange Place, (216) 831-3300
 \$79 single or double

4. Travelodge Beachwood

3795 Orange Place, (216) 831-7200
 \$45 single or double

5. Budgetel

1421 Golden Gate Blvd. (216)442-8400
 \$58 single, \$65 double



Directions

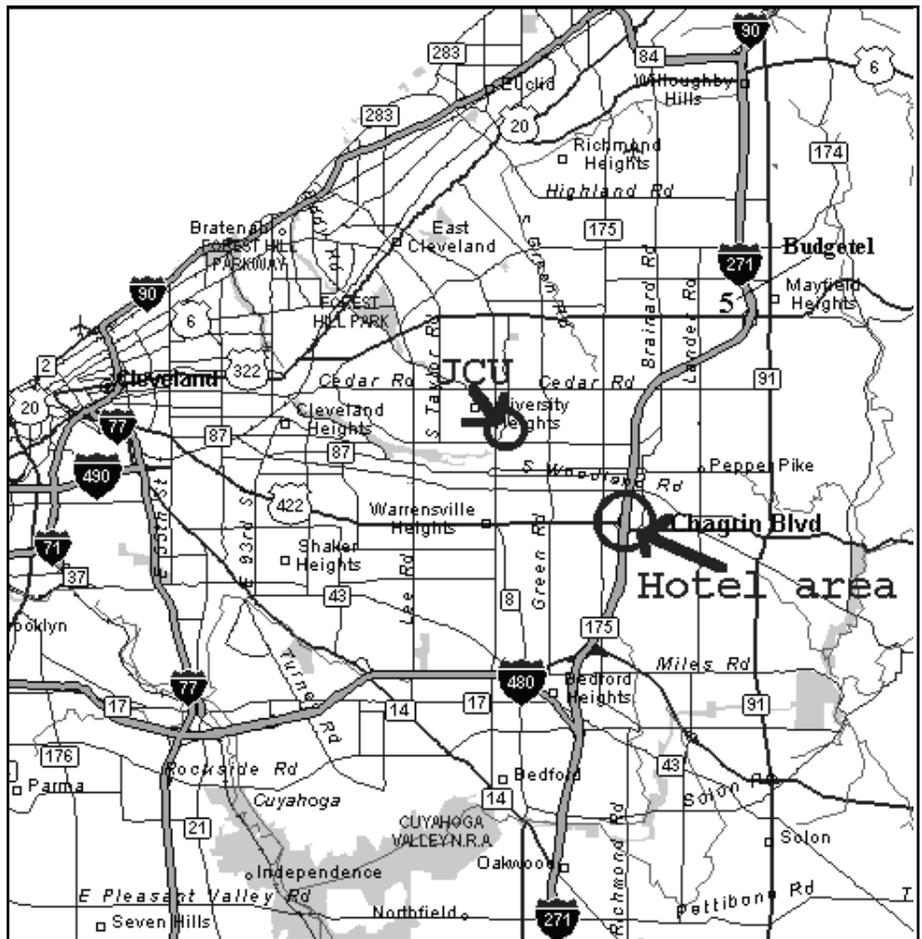
The JCU Campus is located on the east side of Cleveland in suburban University Heights near the intersection of Fairmount Boulevard and Warrensville Center Road.

From out of town you will want to get to **I-271, Chagrin Blvd exit, #29** (Hotel area, which is marked on map at right):

- From the south on I-77 or I-71 take I-271 north.
- From the west on the turnpike take exit 9A to I-480, east to I-271 north.
- From the east on I-80 or I-76, west to turnpike exit 13, then I-480 west to I-271 north.
- From the east on I-90, take I-271 south to Chagrin Blvd.

From there to campus (map left), go west on Chagrin Blvd. (left from the south, right from the north) to Richmond Rd., right (north) on Richmond Rd. to Fairmount Blvd., left (west) to the traffic circle at Warrensville Center Rd., right on the traffic circle to the first street (North Park Blvd.). The campus will be directly in front of you.

The RTA Green Line stop at Warrensville Center Rd. is 3/4 mile south of campus. See the web for local travel directions.



Clip or photocopy; or print from web page.

MEETING REGISTRATION FORM

Undergraduate student form is on page 6.

Name: _____ Phone: _____

Institutional Affiliation: _____ E-mail: _____

Address: _____

City: _____ State: _____ Zip: _____

Amount enclosed: _____ (\$10.00 meeting registration fee; waived for graduate students.)

_____ (\$16.50 banquet – indicate entree below)

_____ Total (Make check payable to Ohio Section, MAA)

Banquet entree: Beef Brisket Chicken Marsala Check if you would like a parking permit mailed to you:

Please check one of the following:

University Four-year Two-year college faculty High school teacher Student Industry/gov. Other

To register for the meeting, mail the completed form, along with your registration fee, to: Darrell J. Horwath, Department of Mathematics and Computer Science, John Carroll University, Cleveland, OH 44118

Due to the Easter holiday, please make banquet reservations by April 8.

Calendar

Ohio Section

April 17-18, 1998, John Carroll U., Cleveland (University Heights)

Summer Short Course, June 24-26, 1998, Ashland U.

October 9-10, 1998, Columbus State CC (with OhioMATYC)

March 26-27, 1999, U. of Dayton

Fall, 1999, College of Wooster

Spring, 2000, Marshall U., Huntington WV.

Fall, 2000, Wittenberg U., Springfield

National MAA-AMS

MAA Mathfest, July 15-18, 1998, Toronto.

January 13-16, 1999, Annual Joint Meetings, San Antonio

January 19-22, 2000, Annual Joint Meetings, Washington, DC

January 10-13, 2001, Annual Joint Meetings, New Orleans

January 6-9, 2002, Annual Joint Meetings, San Diego

Other

NCTM, April 2-5, 1998, Washington, D.C.

Mathematics Awareness Week, April 26-May 2.

BGSU Lukacs Symposium, "Statistics for the 21st Century", April 25-26, 1998, Bowling Green. Organized by C.R. Rao.

Michigan Section, May 1-2, 1998, Western Michigan University.

SIAM Annual Meeting, July 13-17, 1998, University of Toronto.

Midwest Conference on the History of Mathematics, October 2-4, 1998, Iowa State.

Miami Mathematics and Statistics Conference, October 2-3, 1998, "Classroom Models, Demonstrations, and Constructions."

OCTM, October 21-24, 1998, Akron.

AMATYC, November 4-8, 1998, Portland, Oregon.

Indiana Section, Nov. 7, 1998, St. Mary's College, Notre Dame, IN

International Conference on Technology in Collegiate Mathematics, November 19-22, 1998, New Orleans.

Department of Mathematics and Statistics
Bowling Green State University
Bowling Green OH 43403-0221

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