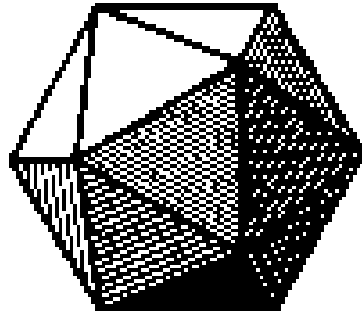


INDIANA SECTION
OF THE
MATHEMATICAL ASSOCIATION OF AMERICA



SPRING 2002
NEWSLETTER



SPRING 2002 SECTION MEETING

*Anderson University
Anderson, Indiana
Friday and Saturday, March 22–23, 2002*

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Indiana Section Web Page: <http://www.maa.org/indiana>

FUTURE MEETINGS

Section

Fall 2002: Indiana University Northwest, Gary, IN, October 5, 2002

Spring 2003: Butler University, Indianapolis, IN, TBA

Fall 2003: Goshen College, Goshen, IN, TBA

National

Summer 2002: MathFest, Burlington, VT, August 1–3, 2002

Winter 2003: Joint Mathematics Meetings, Baltimore, MD, January 15–18, 2003

Other Meetings

19th Annual Rose–Hulman Undergraduate Math Conference: Rose–Hulman Institute of Technology, Terre Haute, IN, March 15–16, 2002

Spring 2002 Ohio Section Meeting: Xavier University, Cincinnati, OH, April 5–6, 2002

2002 Illinois Section Meeting: McKendree College, Lebanon, IL, April 5–6, 2002

2002 Kentucky Section Meeting: Georgetown College, Georgetown, KY, April 5–6, 2002

2002 Michigan Section Meeting: Lawrence Technological University, Southfield, MI, May 10–11, 2002

SPRING MEETING HIGHLIGHTS

Speakers will include:

- Joe Gallian, University of Minnesota–Duluth

- *Breaking Drivers' License Codes*

Many states use complicated algorithms or formulas to assign drivers' license numbers but keep the method confidential. Just for the fun of it, Professor Gallian attempted to figure out how the states code their license numbers. In this talk he will discuss how he was able to break the codes for several of the states. The talk illustrates an important problem-solving technique that is not emphasized in mathematics classes. It also teaches the lesson that sometimes things done just for the sake of curiosity can have applications. (Friday After Dinner Talk)

- *Touring a Torus*

This talk concerns the problem of traversing an m by n directed grid embedded on a torus so that each vertex is visited exactly once before returning to the starting position. We also consider generalizations and variations on this theme. We conclude with an application to computer graphics. (Saturday Talk)

- Margie Brewer, Valparaiso University

Graphs of Essentially Equivalent Lattice Paths

A new family of graphs can be defined using the paths of an $m \times n$ lattice as its vertices. If two paths share $(k+1)$ or more edges, then the corresponding vertices share an edge. We can show when the graphs are connected, when they are trees and the order of the graph. The size of the graph can be determined for $n=1$, and we are currently investigating the size when $n = 2$ and when $n = 3$. We also believe that the independence number of these graphs can be found in polynomial time. (Student presentation.)

- Daniel Callon, Franklin College

Preparing Students for Life After College: An Integrated Professional Development Program

The Department of Mathematics and Computing at Franklin College is piloting a project to create a freshman through senior year integrated professional development program designed to:

- *attract students to mathematics;*
- *acquaint students with mathematics as a discipline and as a profession;*
- *encourage students to take a long-term perspective in making choices during their undergraduate years; and*
- *help students prepare for the transition from the academic culture to the workplace culture.*

This talk will describe the program, its background, and its progress.

- Briana Ehrhardt, Valparaiso University

Markov Chains and License Plates

People now have the ability to purchase specialty license plates in the state of Indiana. For the past year, we have been trying to formulate a system that would analyze and predict the short and long term trends in the plate sales. We are using variations of Markov Chains and we are in the process of creating a functional transition matrix to model the license plate behavior. We will present the development of the model we have constructed at this point and ask for input. (Student presentation)

- Michael Keynes, Purdue University Calumet

The MET report and its recommendations: What, Why, and How?

Since the introduction of the NCTM standards a little over a decade ago, K–12 mathematics teaching in the United States has undergone a fundamental and significant change. As a result, traditional approaches of teacher training at college and universities need to be reexamined. The Conference Board of the Mathematical Sciences recently released the Mathematical Education of Teachers (MET) report to help teacher trainers begin to think about how their courses can prepare future K–12 mathematics teachers for the changing demands of the 21st century classroom. This talk will address four major questions related to the MET report:

1. *What are some of changes in K-12 classrooms over the past decade?*
2. *Why do we need to train teachers differently than the traditional approaches?*
3. *What are some of the suggestions in the MET report?*
4. *What are some exemplary programs that model some of the suggestions in the MET report?*

Instead of presenting a long list of recommendations from the MET report, we will discuss some of the broad ideas behind the document that apply to training of elementary, middle grades, and high school teachers of mathematics.

- Vesna Kilibarda, Indiana University Northwest

The Implementation of Dynamic Geometry Software in a Problem-based Learning and Academic Service Learning Environment

In a collaborative project Dr. Besana and I used the dynamic geometry program, THE GEOMETER'S SKETCHPAD, with its intrinsic invitation to an active, discovery-based learning environment as a means to provide a Problem-Based Learning experience for future teachers. I will present the course materials developed and show analysis of data we gathered to investigate the impact of the approach on students' learning performances and attitudes. The Academic Service Learning component of this project, as well as on-site workshops for teachers, will also be discussed.

- James Lesko, Grace College

Harmonic-Type Series

We will take a look at series of the form $\sum_{n=1}^{\infty} \frac{a_n}{n}$ where $\{a_n\}$ is a bounded, repeating sequence of integers; we call these harmonic-type series. Good examples of harmonic-type series include the divergent harmonic series, $\sum_{n=1}^{\infty} \frac{1}{n}$, and its convergent "cousins", $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n} = \ln 2$, and $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{2n-1} = \frac{\pi}{4}$. We will show a general technique for summing a harmonic-type series, and we will show how the sum of a harmonic-type series is altered under certain term rearrangements.

- Kenneth Luther, Valparaiso University

Mathematical Modeling of Groundwater Flow: A Potentially Interesting Problem

Mathematical modeling of groundwater flow is a topic joining mathematics, fluid mechanics, hydrogeology, environmental science, and computational science. The analytic element method (AEM) is a relatively new technique for modeling groundwater flow. The AEM describes groundwater flow through the introduction of a potential function whose gradient supplies groundwater flux vectors. The AEM can be applied in a wide variety of cases and avoids the need for node-based computational schemes such as the finite difference or finite element methods. Also, solutions produced with the AEM are analytic—the governing differential equation is met exactly, while the required boundary conditions are met approximately. This talk will provide an overview of mathematical modeling of groundwater flow using the analytic element method; applications in both two and three dimensions will be presented.

- Joanne Snow, Saint Mary's College

Views of the Real Numbers and the Continuum

Early approaches to the real numbers were geometric. Mathematicians spoke of the “law of continuity” or a continuous variable or magnitude with the image of the real line in mind. In the second half of the 19th century, algebraic or arithmetic descriptions of the real numbers were given by Dedekind, Cantor, and Weierstrass. After developing the theory, each returned to the issue of relating the real numbers to the real line. Dedekind said that while to every point, one can attach a number, it must be taken as an axiom that to each number there exists a point on the line. Cantor agreed on this point; however, Cantor had different ideas about the continuum. To Cantor, a continuum is perfect and connected. Cantor and Dedekind discussed the issue of a continuum and the defining characteristic of the real numbers in a series of letters. To learn of Weierstrass's development of the real numbers, we must rely on lecture notes as recorded by his students. Looking at the notes, we find Weierstrass gives a thorough development of the real numbers. In speaking of the analogy between the real numbers and the line, Weierstrass shows how one associates a real number to a given length, and conversely how one intuitively associates a length to a given number.

- Robert Talbert, Franklin College

26.2 Miles is Long Enough: The Effects of Weaving While Running a Marathon

A marathon is 26.2 miles long, provided the runner stays on the “true” path of the race without deviating. However, inexperienced (or tired!) runners often weave from side to side during a long run and thus add distance to their course. This talk addresses the question: How much further than 26.2 miles would a “weaving” runner travel over the course of a marathon? The investigation involves an interesting mix of math modeling, trigonometry, calculus (single- and multi-variable), and numerical methods, with some unexpected mathematical twists along the way.

For the complete fall meeting schedule, see

<http://www.rose-hulman.edu/~rader/INMAA/meetings/spring02.html>

Indiana College Math Competition (ICMC)

The 37th Annual Indiana College Math Competition (ICMC) will be held on Friday, March 22, 2002. Registration for the competition will begin at 2:30 pm. A briefing session on the competition will begin at 4:15 pm and the test will be administered from 4:30-6:30 pm immediately following the briefing. As usual, each school may enter as many teams as desired, and there is a \$5.00 registration fee per team (payable on March 22). Team members wishing to attend the Friday evening dinner buffet and Saturday lunch buffet must also make reservations (see *Meeting Registration and Parking* below.)

SECTION NEWS

Ball State University

2001 Outstanding Senior Awards were given to Anthony Enk (Actuarial Science) and Jessica Schilling (Endorsement/Mathematics Concentration).

Five new professors have joined the faculty:

- Dr. Stoyu T. Barov, Assistant Professor (Ph.D. The University of Alabama, 2001, Topology)
- Mr. Curtis Gary Dean, Lincoln Financial Group Distinguished Professor of Actuarial Science, (M.A. University of Wisconsin–Madison, 1974, Mathematics)
- Dr. Forhad MD. Hossain, Visiting Professor, on leave for the 2001-02 year from Jahangirnagar University of Bangladesh, (Ph.D. Institute of Statistical Mathematics, Tokyo, Japan, 1995, Discrete Probability and Discrete Mathematics)
- Dr. Jean-Pierre Lokemba Liamba, Assistant Professor (Ph.D. University of Wisconsin–Milwaukee, 2000, Partial and Ordinary Differential Equations, Special Functions, Orthogonal Polynomials)
- Dr. Ahmed Mohammed, Assistant Professor (Ph.D. Temple University, 1995, Partial Differential Equations).

Dr. John Lorch and Dr. Sheryl Stump have been promoted to Associate Professor, effective Fall 2001.

Huntington College

Dr. Patrick Eggleton of the Mathematics and Computer Science Department is the President–Elect of the Indiana Council of Teachers of Mathematics for 2002. He will then serve as president for 2003, 2004. Dr. Eggleton joined the Huntington College faculty in 1999, after having taught for several years at Berry College.

Indiana University–Bloomington

The following are the 2001 new tenure/tenure–track faculty in the Department of Mathematics:

- Dr. Kevin Pilgrim–Assistant Professor, Ph.D. 1994 - University of California, Berkeley Field of study: Analysis B.S. 1989 - Indiana University; 1998–2001 Assistant Professor, University of Missouri at Rolla.
- Dr. Koby Rubinstein–Professor, Ph.D. 1985–Courant Institute, New York University, Field of study: Differential equations, asymptotic analysis, continuum mechanics, vision, optics, math modeling; 1996–2001 Professor, Dept of Mathematics, Technion, Israel. Professor Rubinstein is one of the top mathematicians of the world. He is a previous chair of the Applied Mathematics Committee of the Israel Ministry of Science and Technology. Professor Rubinstein is a frequent consultant with industry, especially in the area of optics (i.e. lens manufacturing).
- Dr. Matthias Weber–Assistant Professor, Ph.D. 1992–University of Bonn, Field of study: Geometry; 2000–2001 Research professorship at Mathematical Science Research Institute, Berkeley.

Indiana University Northwest

The 2002 Fall Meeting of the Indiana Section of the MAA will be held Saturday, October 5, 2002 at Indiana University Northwest in Gary, Indiana. For more information about their department of mathematics or the meeting please visit: <http://www.iun.edu/~math/>

Purdue University North Central

Dr. Sheon-Young Kang is a new faculty member from South Korea who received his Ph.D. in Mathematics from the University of Connecticut in June 2000. Dr. Young's research interests are in Numerical Solutions to Integral Equations. Dr. Young taught one year at the University of New Orleans prior to coming to PNC this past fall 2001.

Dr. David Feikes (together with Dr. Keith Schwingendorf, PNC, Danny Breidenbach, Purdue West Lafayette, Coordinator Elementary Education Content Courses, and Jeff Gregg a free lance writer for Addison-Wesley) received a \$75,000 NSF CCLI Proof of Concept grant for the project "Connecting Mathematics for Elementary Teachers (CMET)." The purpose of the project is to connect prospective elementary teachers' learning of mathematics in their college/university elementary education mathematics content courses with how children understand and learn mathematics. The goals are to 1) enhance pre-service teachers' understanding of mathematics, 2) improve their teaching of mathematics, 3) improve prospective elementary teachers' understanding of how children learn and understand mathematics, 4) help them connect the mathematics they are learning with the mathematical concepts they will be teaching children, and 5) facilitate prospective elementary teachers understanding of the connection between the mathematics they will be teaching in elementary school to the mathematics and technological skills children learn in middle and high school. The grant runs from January 2002 through June 2003.

Dr. Keith Schwingendorf is now Acting Chairperson of the Mathematics/Physics Section.

Rose-Hulman Institute of Technology

Last year, Rose-Hulman hired three new faculty members in the mathematics department, Diane Evans, Joshua Holden and Tom Langley. Brief biographies of these new faculty members are given below.

Dr. Evans received her B.S. (1990) and M.A. (1992) degrees in mathematics from The Ohio State University, and an M.S. (1998) in operations research from The College of William and Mary. Diane received her Ph.D. in probability from William and Mary in August 2001. She has taught as an instructor of mathematics at Wittenberg University and at Virginia Wesleyan College.

Dr. Holden got his Ph.D. from Brown University in 1998; he taught at the University of Massachusetts and at Duke University before coming to Rose-Hulman. His graduate studies were in algebraic number theory and he is also interested in computational number theory and cryptography. His non-mathematical interests currently include science fiction, choral singing, and needlework.

Dr. Langley got his Ph.D. from University of California, San Diego in June of 2001. His mathematical interests include algebraic combinatorics, symmetric functions, and graph theory.

St. Joseph's College

For this year and next year, St. Joseph's College has been accepted as one 30 or so Colleges or Universities to participate in the "Teaching Scholars Partnership" (TSP) program. You can out find out more about this program at their TSP website at <http://www.saintjoe.edu/~tsp/>.

Taylor University

Dr. Matt DeLong coauthored a book with Dr. Dale Winter of Harvard entitled "Learning to Teach and Teaching to Learn Mathematics." Published by the MAA, the book addresses the training of college mathematics instructors.

Taylor University Press published "Open to Reason" by Dr. David Neuhouser. The book compares the roles of reason, imagination, faith and love in mathematics and religion.

Students David Aukerman and Shawn Alspaugh attended REU's at Cal Poly San Luis Obispo and Oregon State, respectively during the summer of 2001.

Dr. Jeremy Case and Dr. Mark Colgan were awarded tenure, effective August 2002.

In Memoriam

Duane E. Deal

(May 19, 1924 – May 20, 2001)

Few faculty members can rival Duane Deal's exemplary record of service. Ball State was the mainstream of his life for fifty years. He joined the Department of Mathematical Sciences in 1952. Though his frenzied pace had slowed a bit since his retirement in 1992, there were times when he seemed literally to be everywhere and to do everything - from the Department of Mathematical Sciences to the Theta Chi house to Emens Auditorium to University Gym to the Muncie Public Library to commencement on the Arts Terrace.

He served on or chaired more than fifty university councils and committees, in addition to serving as administrative assistant, acting chairperson, and chairperson of the Department. He received the university's first faculty service award in 1972. His knowledge and love of history in general, and the history of mathematics in particular, brought invitations to speak at more than sixty local, state, regional, and national meetings and caused him to be selected as a member of the editorial board for the thirty-first yearbook of the National Council of Teachers of Mathematics.

Mr. Deal's popular column, "Mathematical Oddments" in the Indiana Mathematics Teacher, amused and enlightened countless teachers and students. With all of this activity, besides the presidency of the Sigma Zeta Honorary Science Society and every office in the Indiana Section of the Mathematical Association of America, he still found time to be an effective, caring classroom teacher.

SPRING 2002 MEETING INFORMATION

Directions to Anderson University

- From the North
 - Starting on I-69:
Follow I-69 south to Exit 34 (State Road 32). Turn right on SR 32 (west). Follow SR 32 approximately five miles to SR 9 (Scatterfield Road). Continue across Scatterfield Road and proceed on University Boulevard to College Drive and turn left.
 - Starting on I-65:
Follow I-65 south to SR 28. Turn left and follow SR 28 (east) to SR 9 (Scatterfield Road), approximately 55 miles. Turn right on SR 9 (Scatterfield Road); do not take the SR 9 business route. Proceed to University Boulevard; turn right, then left on College Drive.
 - Starting on SR 9:
Follow SR 9 south to Anderson; stay left; do not take the business route. Follow SR 9 to University Boulevard; turn right, then left on College Drive.
- From the South
Follow I-69 to Exit 26, SR 9 (Scatterfield Road). Follow SR 9 approximately five miles to University Boulevard; turn left, then left again on College Drive.
- From the East
 - Starting from I-74:
Follow I-74 to Exit 113, Shelbyville. Turn right on SR 9 (north) to I-69. Turn right on I-69 (north), to Exit 26, SR 9 (Scatterfield Road). Follow Scatterfield Road north approximately five miles to University Boulevard; turn left, then left again on College Drive.
 - Starting on I-70:
Follow I-70 to Exit 115. Turn left (north) on SR 109 and follow into Anderson. State Road 109 is also called Scatterfield Road. Continue on Scatterfield Road about 5 miles to University Boulevard; turn left, then left again on College Drive.
- From the West:
 - Starting in Indianapolis:
Follow I-70 or I-74 to I-465 North around Indianapolis. Follow I-465 to I-69 North (Anderson/Ft. Wayne). Take I-69 to Exit 26 and turn (north) on SR 9 (Scatterfield Road) to University Boulevard; turn left, then left again on College Drive.
 - Starting on SR 32:
Follow SR 32 through Edgewood into Anderson. Turn left on Raible Drive (Wendy's restaurant on corner) to East 8th Street (first stop light). Turn right on East 8th Street through downtown (cross the river) to College Drive. Turn left on College Drive to East 5th Street.

Meeting Registration and Parking

The MAA meeting will take place in Hartung Hall, building number 26 on the campus map below. Parking is available in a lot directly east of this building. Additional parking is available in a new parking lot one-half block east of Hartung Hall on the south side of Fifth Street.

Registration will be held in Hartung Hall and will begin at 2:30 pm on Friday and 8:00 am on Saturday. A meeting registration fee of \$10.00 will be collected from each non-student attendee. There is no registration fee for students. All attendees, including students, are expected to sign-in at the registration table.

Please note that Anderson University is a smoke free environment.

Meal Reservations

Meals will all be held in the Anderson University Student Center. These include a buffet on Friday evening, a sandwich buffet with salad and soup for noon on Saturday, and a breakfast for the campus MAA representatives on Saturday morning. Costs for the meals are as follows: \$16.00 per person for the Friday night buffet, \$6.50 per person for the Saturday breakfast for the Campus Representatives, and \$7.50 per person for the Saturday noon soup, salad and sandwich buffet. Advanced reservations are required.

Reservations for the meals may be made no later than 12:00 noon, Friday, March 15, 2002, in one of the following ways:

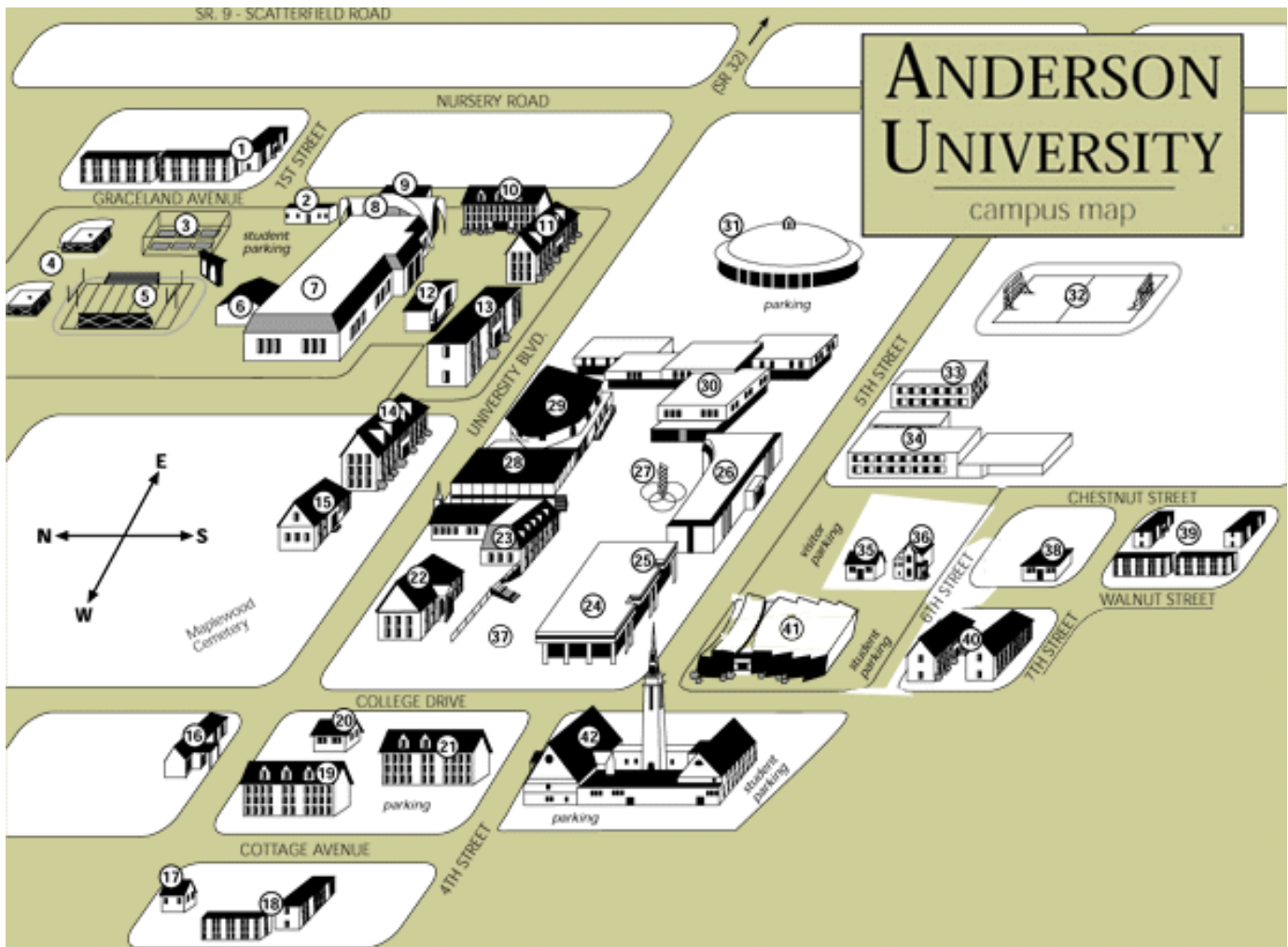
- Call Patty Gallagher at 765-641-4314 or Stanley Stephens at 765-641-4410.
- Send an e-mail message to Patty Gallagher at *pag@anderson.edu*. Email reservations will be acknowledged by email.

Accommodations

- Hampton Inn, 2312 Hampton Drive Scatterfield Rd (south) (765) 622-0700. I-69 and SR 9 (Exit 26 on I-69) on the south side of Anderson. When making reservations, mention the Indiana MAA for the special rate of \$59 plus tax. A block of rooms is reserved until February 29.
- Additional motels are listed below. (*offers Anderson University discount. Most of these motels are off I-69 and SR 9 at Exit 26.)
 - *Baymount Inn 229 East 59th Street (765) 649-3000
 - *Best Inns 5706 Scatterfield Road (765) 644-2000
 - *Hawthorn Inn Suites 1836 East 64th Street (765) 641-9980
 - *Comfort Inn, 2205 East 59th Street, (765) 644-4422
 - *Holiday Inn, 5920 Scatterfield Road, (765) 644-2581
 - *Lees Inn, 2114 East 59th Street, (765) 649-2500
 - Motel 6, 5810 Scatterfield Road, (765) 642-9023
 - *Super 8, 2215 East 59th Street, (765) 642-2222
 - *Plum Retreat Bed and Breakfast, 926 Historic West 8th Street, (765) 649-7586

Please reserve your room early.

CAMPUS MAP



1 Mansfield Apartments; 2 Intercollegiate Athletic Office; 3 Tennis Courts; 4 Raven Park; 5 Macholtz Stadium; 6 Bennett Natatorium; 7 Wellness Center (Under Construction); 8-9 O.C. Lewis Gymnasium; 10 Smith Hall; 11 Martin Hall; 12 Health Clinic and Sports Med Center; 13 Rice Hall; 14 Dunn Hall; 15 Boyes House; 16 Smith House; 17 Bolitho House (Security Services); 18 Purdue Statewide; 19 Myers Hall; 20 Morrison House; 21 Morrison Hall; 22 Nicholson Library; 23 School of Theology; 24 Decker Hall; 25 Admissions-Welcome Center; **26 Hartung Hall**; 27 Helios; 28 Olt Student Center; 29 Byrum Hall; 30 Krannert Fine Arts Center; 31 Warner Auditorium; 32 Soccer Fields; 33 Hardacre Hall; 34 Church of God Ministries; 35 Kissinger Learning Center; 36 Broadcasting Center; 37 The Valley; 38 Miller House; 39 South Campus Apartments; 40 Tara East Apartments; 41 Reardon Auditorium; 42 Park Place Church of God

please post

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SPRING 2002 MEETING

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