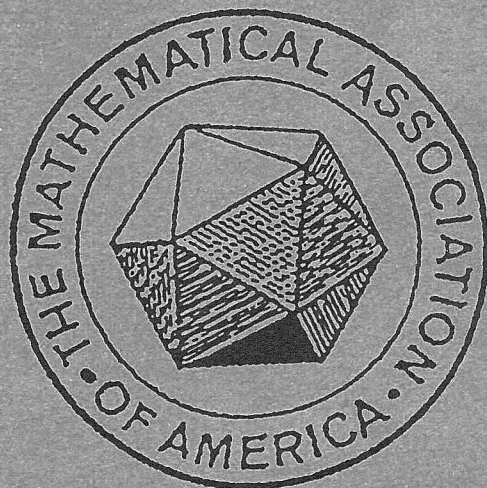# Spring Conference

Kansas Section
Mathematical Association of America
and Kansas Mathematics Association
of Two Year Colleges

April 19-20, 1996

Hosted by
McPherson College
McPherson, Kansas

Invited Speaker:
V. Frederick Rickey
"The History of Improper Integrals"
"Ways of Using History to Motivate Calculus"

Officers of MAA-Kansas Section
Governor: Willard A. Parker
Kansas State University
Manhattan, Kansas 66506-2602, (913) 532-6750

Chair: Prem N. Bajaj
Wichita State University
Wichita, Kansas 67260-0033, (316) 689-3941

Chair-Elect: Mary S. Flagg
McPherson College
McPherson, Kansas 67460, (316) 241-0731

Secretary-Treasurer: Peter R. Flusser
Kansas Wesleyan University
Salina, Kansas 67401-6196, (913) 827-5541

Officers of Kansas Mathematics Association of Two Year Colleges
President: Therese Blyn
Garden City Community College
Garden City, Kansas 67846, (316) 276-7611

President Elect: Jim Carlson
Neosho County Community College
Chanute, Kansas 66720, (316) 431-2820

Secretary: Penny Seavertson
Johnson County Community College
Overland Park, Kansas 66210, (913) 469-8500

Treasurer: Donna Krichiver
Johnson County Community College
Overland Park, Kansas 66210, (913) 469-8500

SPRING CONFERENCE PLANNING COMMITTEE
Representing MAA - Kansas Section
Bill Parker, Kansas State University
Prem N. Bajaj, Wichita State University
Mary S. Flagg, McPherson College
Peter R. Flusser, Kansas Wesleyan University

Representing KMATYC
Kay Dundas, Hutchinson Community College

Representing McPherson College - Host Institution
Doug Burkholder
Bob Neufeld

Spring Conference of Mathematical Association of America

Kansas Section
and
Kansas Mathematics Association of Two Year Colleges

Conference at a Glance

Friday, April 19

3:00 p.m. - 5:00 p.m.	WORKSHOPS
6:30 p.m. - 7:30 p.m.	REGISTRATION
7:30 p.m. - 8 :30 p.m.	GENERAL SESSION
	"The History of Improper Integrals"
	—V. Frederick Rickey
8:30 p.m. - 10:30 p.m.	RECEPTION
9:00 p.m. - midnight	STUDENT SOCIAL

Saturday, April 20

7:00 a.m. - 8:00 a.m.	DEPARTMENT CHAIR BREAKFAST
8:00 a.m. - 8:30 a.m.	REGISTRATION
8:00 a.m. - 3:30 p.m.	BOOK DISPLAYS
8:30 a.m. - 9:30 a.m.	SESSIONS I: A, B, C, D
9:30 a.m. - 10: 30 a.m.	SESSIONS II: A, B, C, D
10:30 a.m. - 11:00 a.m.	BREAK
11:00 a.m. - 12 noon	GENERAL SESSION
	"Ways of Using History to Motivate Calculus"
	—V. Frederick Rickey
12 noon - 1:30 p.m.	LUNCH
1:30 p.m. - 2:30 p.m.	SESSIONS III: A, B, C, D, E
2:30 p.m. - 3:30 p.m.	MAA BUSINESS MEETING

Friday, April 19

WORKSHOPS
Advanced registration required. Refreshments served at 2:45.
Each workshop will meet from 3:00 to 5:00 p.m. on Friday.

WORKSHOP #1:
"Cooperating to Learn Undergraduate Mathematics"
Leader:　　　　Pat Mower
　　　　　　　Washburn University
　　　　　　　(Miller Library, Room 104)

This workshop will include a cooperative demonstration of some of
the small group activities used in undergraduate courses, a discussion
of the pros and cons of this teaching and learning practice, and some
examples of student's cooperative work and comments. The work-
shop is based on an article, "Cooperating to Learn Statistics," by Dr.
Mower.

WORKSHOP #2:
"Symbolic Partial Fractions and Other Analytic Programs on a Hand Calculator"
Leader:　　　　Robert Adams
　　　　　　　University of Kansas
　　　　　　　(Miller Library, Room 105)

This workshop will demonstrate a variety of analytic programs used
in calculus and other courses. In the Harvard curriculum "analytic" is
one of the triad and the hand calculator can do much to alleviate the
boring details in some of these calculations cf. expanding a partial
fraction with denominator of degree four.

The HP 48 will be used in the demonstrations. Additional calculators
will be available so the participants can do hands-on.

The program for partial fractions will be used both for integrating
rational functions and inverting Laplace transforms.

Symbolic substitution in definite integrals and integration by parts
are two other programs to be covered. These programs assist the
student in practicing these two skills. Miscellaneous programs such
as graphical Newton's method and others will be demonstrated as
time permits.

Friday, April 19

REGISTRATION
6:30 - 7:30 p.m. — Friendship Hall

GENERAL SESSION
7:30 - 8:30 p.m. — Brown Auditorium
> Introductions: Mary Flagg, Chair-elect MAA
> Welcome: Dr. Paul Hoffman, McPherson College President

"The History of Improper Integrals"
V. Frederick Rickey
Distinguished Teaching Professor
Bowling Green State University
and
Editor of MAA Electronic Services

As with so many fundamental concepts in analysis, it was Cauchy who gave precise definitions of improper integrals. The concept however, has its roots in the seventeenth century. We will discuss Torricelli's example of an infinite solid with finite volume and Sluse's glass "that had a small weight, but that even the hardiest drinker could not empty." The talk will be understandable to all who have studied improper integrals in calculus.

RECEPTION
8:30 - 10:30 p.m. — Friendship Hall
> All participants, faculty, students, and guests are welcome.

STUDENT SOCIAL
9:00 p.m. - Midnight — Student Union
> All students are invited to enjoy refreshments, conversation, videos, pool, and ping pong.

Saturday, April 20

7:00 - 8:00 a.m.
Sirloin Stockade
Best Western
Holiday Manor

DEPARTMENT CHAIR BREAKFAST
Advanced registration required.
Host: Prem N. Bajaj, Chair MAA - Kansas section

"Professional Development"
Discussion Leader
Bill Parker, Governor MAA - Kansas section
Kansas State University

8:00 - 8:30 a.m.
Friendship Hall

REGISTRATION

8:00 a.m. - 3:30 p.m.
Friendship Hall

BOOK DISPLAYS

8:30 - 9:30 a.m.
Miller Library

SESSIONS I: A, B, C, D

Room 105

SESSION I: A
Science Success Strategies:
An Interdisciplinary Approach
Presenters: Stephen A. Angel (Chemistry),
Donna E. LaLonde (Mathematics & Statistics)
Washburn University

Room 101

SESSION I: B
Presider: Arnold Wedel, Bethel College

The Geometer's Sketchpad and Analytic
vs. Synthetic Proof: An Example
Presenter: Bryan Dawson
Emporia State University

mcPhERSON
K A N S A S

**■Best Western
Holiday Manor**
Jct. I-135 & US 56
2211 E. Kansas
316-241-5343
Best Western toll free:
1-800-528-1234
110 rooms

Outdoor swimming pool;
private club, restaurant; indoor
pool & whirlpool; sauna; cable
tv & Showtime; banquet/meeting
facilities; small pets (up to
25 lbs).

■Chambers Motel
906 W. Kansas
316-241-2635
8 rooms

Cable tv; four-day and
weekly rates available; all
ground floor rooms; small
(trained) pets allowed.

**■The Cranberry House
Bed & Breakfast**
303 S. Walnut
316-241-3331

Three rooms available in lovely
renovated historic home; down-
town and restaurants nearby;
no smoking; no pets.

■El Morocco Motel
1125 W. Kansas
316-241-3240
16 rooms

Cable tv; in-room coffee; non-
smoking rooms and rooms for
physically challenged available;
all ground floor rooms.

■Red Coach Inn
Jct. I-135 & US 56
2111 E. Kansas
316-241-6960
toll free reservations:
1-800-362-0072
88 rooms

Family restaurant; indoor pool
and whirlpool; sauna; fun dome
recreation area with video games,
pool tables, putting green, play-
ground, ping-pong, and large-screen
tv; cable tv & HBO; banquet/meeting
facilities; trained pets only.

■Super 8 Motel
2110 E. Kansas
316-241-8881
Super 8 toll free:
1-800-800-8000
42 rooms

Restaurants adjacent; remote
control cable tv; HBO; free
coffee and pastries; free local
calls; interior corridors; non-
smoking rooms and group
tour rates available; no pets.

■Wheat State Motel
1137 W. Kansas
W. Kansas at 81 By-Pass
316-241-6981
48 rooms

Outdoor swimming pool; cable tv;
free coffee; restaurants nearby; rec-
reation center (kitchen, pool table);
laundry facilities; free local calls;
non-smoking rooms available; trained
adult dogs only (with advance notice).

**■Mustang Mobile Park
for RVs**
1909 Millers Lane
(just west of
Centennial and
First Streets)
316-241-0237

24 RV campsites for self-contained
units; no tents; concrete pad; full
hook-up; picnic tables in summer;
nightly, weekly, monthly rates.
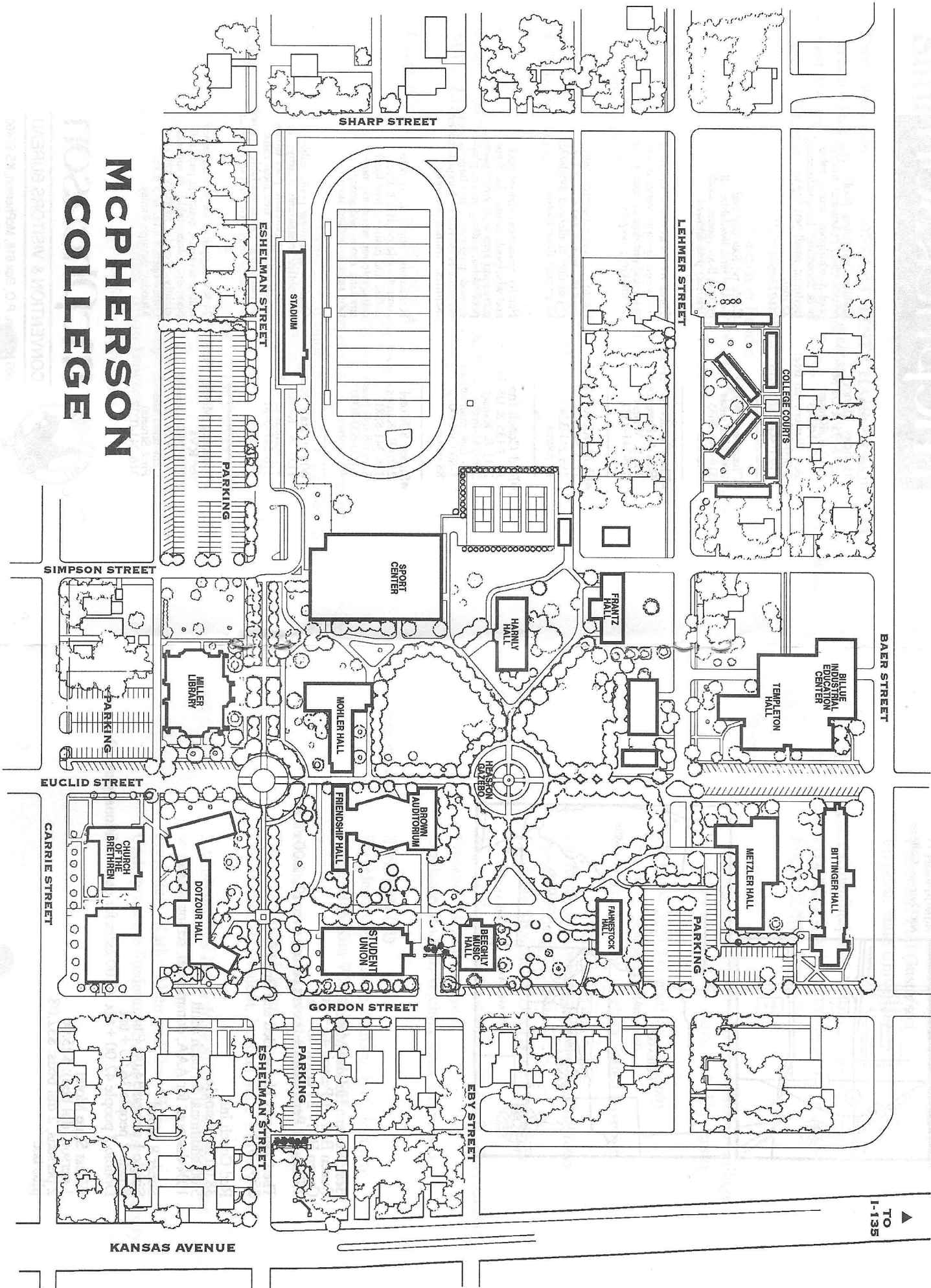Office open 8 a.m. to 5 p.m.
Monday through Friday.

mcPhERSON
CONVENTION & VISITORS BUREAU

306 N. Main, P.O. Box 616, McPherson, KS 67460
316-241-3340 • 800-324-8022

McPHERSON COLLEGE

SHARP STREET

ESHELMAN STREET

LEHMER STREET

STADIUM

PARKING

COLLEGE COURTS

BAER STREET

SIMPSON STREET

SPORT CENTER

FRANTZ HALL

HARNLY HALL

BILLUE INDUSTRIAL EDUCATION CENTER

TEMPLETON HALL

MILLER LIBRARY

PARKING

MOHLER HALL

HESSON GAZEBO

EUCLID STREET

CARRIE STREET

CHURCH OF THE BRETHREN

FRIENDSHIP HALL

BROWN AUDITORIUM

METZLER HALL

BITTINGER HALL

DOTZOUR HALL

BEEGHLY MUSIC HALL

FAHNESTOCK HALL

PARKING

STUDENT UNION

GORDON STREET

ESHELMAN STREET

PARKING

EBY STREET

KANSAS AVENUE

TO I-135
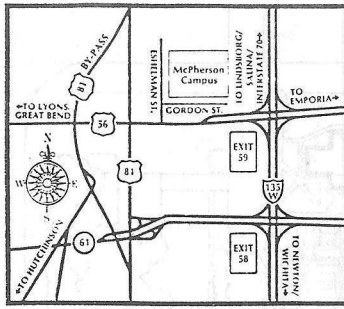
How To Reach
McPherson College

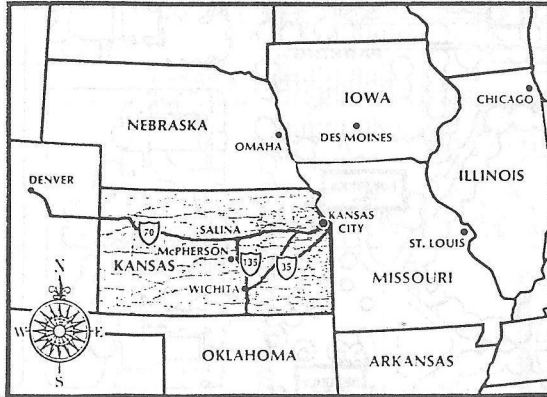From Denver:
I-70 East to I-35 South (400 mi.)
From Kansas City:
I-70 West to I-35 South (210 mi.)
From Wichita:
I-35 North (60 mi.)

Best Western Holiday Manor
Queen Bed - 1 Person 42 + tax.
Queen Bed - 2 Person 46 + tax.
2 Beds - 2 Persons 48 + tax ext person over 12, 2.00 each

The Cranberry House Bed and Breakfast
$50 - $75

Red Coach Inn
38.00 for a single
5.00 additional for each adult
10% discount for AAA, commercial, senior citizen

Super 8 Motel
Single 1 person 34.00 + tax.
Single 2 people 36.00 + tax
Double 2 people 42.00 + tax (3.00 extra for each additional person)

Wheat State Motel
1 person (dbl bed): $25.06
2 persons, 2 dbl beds: $32.08
plus tax.

A Reflection on the Project Next Experience
Presenter: Phil Gustafson
Emporia State University

A Computational Abstract Algebra Course
Presenter: Cynthia Woodburn
Pittsburg State University

Room 106 SESSION I: C
Presider/Judge: Richard Rempel, Bethel College
Judge: Ellen Veed, Ft. Hays State University

On Numerical Thermal Tomography
Presenter: Aleaddin Elayyan
Graduate Student, Wichita State University

On Radiation Treatment Planning Problems
Presenter: Sergei Lissianoi
Graduate Student, Wichita State University

Inverse Parabolic Problems with Final Observations
Presenter: Ilya Bushuyev
Graduate Student, Wichita State University

Room 104 SESSION I: D
Presider/Judge: Elaine Tatham, ETC Institute
Judge: Han Kun Wang, Wichita State University

Evolutionary Prisoner's Dilemma with Noise
Presenter: John Herbert
Undergraduate Student, Kansas State University

2 Mathophobes Learn How to Apply Mathematics to Politics
Presenters: Kathy Allen and Tracy Weis
Undergraduate Students, Kansas Wesleyan University

9:30 - 10:30 a.m.   SESSIONS II: A, B, C, D
Miller Library

Room 105   SESSION II: A
                        Basic Skills/Gateway/Exit Exams -
                        What, Why, and How?
                        Moderator: Elwyn Davis, Pittsburg State University
                        Panel members:
                                Cynthia Woodburn - PSU
                                Dave Lerner - KU
                                Jack Porter - KU
                                Marian Hukle - KU graduate student.

Room 101   SESSION II: B
                        Presider: Kathy Starke, Wichita State University

                        Why do Pianos have Black Keys?
                        Presenter: Andrew G. Bennett
                        Kansas State University

                        Mathematics and Art:
                        The Symmetry of Integration
                        Presenter: Reza Sarhangi
                        Southwestern College

                        Stabilizability Issues
                        in Coupled Hyperbolic Equations
                        Presenter: Reza Sarhangi
                        Southwestern College

Room 106   SESSION II: C
                        Presider/Judge: Ellen Veed, Ft. Hays State Univ.
                        Judge: Richard Rempel, Bethel College

                        Approximations of Stochastic Partial
                        Differential Equations
                        Presenter: Peter Zimmer
                        Graduate Student, University of Kansas

Adaptive Pole Placement Problem
Presenter: A.J. Gao
Graduate Student, University of Kansas

Room 104   SESSION II: D
Presider/Judge: Han Kun Wang, Wichita State Univ.
Judge: Elaine Tatham, ETC Institute

Stochastic Processes in an Elementary School Science Fair Project
Nathan M. Welch
Undergraduate Student, University of Kansas

Maximization of Interference Ratios in an RDRN
Shane Haas
Undergraduate Student, University of Kansas

10:30 - 11:00 a.m.   **REFRESHMENT BREAK**
Friendship Hall

11:00 - 12:00 noon   **GENERAL SESSION**
Brown Auditorium   Information: Mary Flagg, Chair-elect Kansas
Section MAA, McPherson College
Introduction: Prem Bajaj, Chair Kansas Section
MAA, WSU

"Ways of Using History to Motivate Calculus"
V. Frederick Rickey
Distinguished Teaching Professor, Bowling Green State University
and Editor of MAA Electronic Services

The calculus has an interesting history that should be used by teachers to improve student motivation and understanding. Rather than argue this point in the abstract, examples will be given of how the speaker has effectively used history in the classroom. Topics will include "What to say on the first day of a calculus class," "Leibniz got the product rule wrong," "Gregory of Saint Vincent and the logarithm" and "How Cotes discovered the derivative of the sine."

12:00 n. - 1:30 p.m. Student Union	**LUNCH** **Advanced reservation required.**
	MAA - Student Chapters Business Meeting KMATYC Business meeting Chair: Therese Blyn, Garden City C.C. MAA and all others - no formal meeting
1:30 - 2:30 p.m. Miller Library	**SESSIONS III: A, B, C, D, E**
Room 105	SESSION III: A *Explorations in College Algebra* Judy Stubblefield & Sandy Crumet Garden City Community College
Room 101	SESSION III: B Presider: Ron Sandstrom, Ft. Hays State Univ. *Mathematics and the Core Curriculum* Dan Daniel Director of Integrative studies Southwestern College *Encouraging Young Women to Excel in Mathematics* Marvin Harrell and Elizabeth Yanik Emporia State University *General Education and Statistics:* *Forming a Regional Teacher Network* Deborah J. Rumsey Kansas State University
Room Second Floor	SESSION III: C Presider: Ted Zerger, Kansas Wesleyan Univ. *Non-Linear Regression Techniques May Not* *Produce Best Fit Curves!* Steven J. Wilson Johnson County Community College

Inducing Planar Projective Regular Polygons
Doug Burkholder
McPherson College

Room 106   SESSION III: D
Presider/Judge: Richard Rempel, Bethel College
Judge: Ellen Veed, Ft. Hays State University

In Search of the Gröbner Basis
Mitch Richling
Graduate Student, Pittsburg State University

A Nonstandard Trial (Free Boundary) Method
Ercan Kadakal
Graduate Student, Wichita State University

Hi Control Design Using Mathematical Methods
Joseph H. Dinh
Graduate Student, Wichita State University

Room 104   SESSION III: E
Presider/Judge: Elaine Tatham, ETC Institute
Judge: Han Kun Wang, Wichita State University

The Way The Universe Ticks
Darian Dulin
Undergraduate Student, Southwestern College

*Tessellations: "The Geometry of Art and
The Art of Geometry"*
Travis Ethridge
Undergraduate Student, Southwestern College

Trigonometry in Optics
Brandon Sommer
Undergraduate Student, Southwestern College

2:30 - 3:30 p.m   **MAA BUSINESS MEETING**
Miller Library
Room 101