

DEPARTMENT OF MATHEMATICS
Annual Report to the Board of Trustees of
Rose-Hulman Institute of Technology
1 June 06 -31 May 07

1. Department Overview
2. Personnel Changes
3. Student and Alumni Highlights
4. Faculty and Staff Activities
 - a. Teaching, Curriculum Development, and Student Advising
 - b. Professional Development and Student Project Mentoring
 - c. Professional Service
 - d. Faculty Honors and Awards
 - e. Membership in Interdepartmental Faculty Clusters
5. Grants and Continuing Grant Activities
6. Departmental Programs

1. Department Overview

This was a successful year for the department. In addition to good teaching, professional development, and service programs on the part of the faculty, here are some high points:

- a. Successful hiring faculty member in Applied Mathematics to replace loss of Brian Martensen
- b. 45% or more of incoming freshman have advanced math placements, allowing them to get AP credit for one or more calculus classes. Fast Track Calculus is over 10% of the freshman class. The math schedule accommodates all these students starting at different places in the curriculum, allowing students to take full advantage of their advanced placements.
- c. There is significant interest in mathematics courses beyond calculus, differential equations and basic statistics. Almost 30% of students are taking these “beyond the foundation” courses.
- d. Very strong participation by students in the math seminar, both as speakers and as attendees.
- e. Three students have elected to complete a senior thesis two years in advance of when the requirement becomes effective
- f. Continuing success in undergraduate mathematics research through student research and presentations,
 - NSF-REU (19 years),
 - Undergraduate Math conference (24 years)
 - and Undergraduate Journal (118 papers and 196 authors in the 7.5 years of its existence)

- g. Continuing support of mathematics outreach programs in High School Math Contest, hosting regional MathCounts, and administrative support for American Mathematics Competitions and MathCounts

2. Personnel Changes

Joining Rose-Hulman

- *Tanya Jajcay* – coming from Comenius University, Bratislava, Slovakia
- *Donald (Don) Mills* -coming from Southern Illinois University

Sabbaticals

- *Kurt Bryan* - was on sabbatical at Rutgers University, Winter and Spring quarters

Leaving

- *Ghan Bhatt* – finishing a two year visiting appointment
- *Kenneth McMurdy* – leaving to go to Ramapo College of New Jersey
- *Donald Mills*

3. Student and Alumni Activities

Pi Mu Epsilon Honorary Mathematics Fraternity: Twenty-two new members of the Rose-Hulman student body were inducted at the spring 2007 Initiation Banquet for the Indiana Gamma Chapter of Pi Mu Epsilon. The speaker was *Richard Lenar*, F.S.A., M.A.A.A..

Mathematics Competitions

- **18th annual Alfred R. Schmidt Freshman Mathematics Competition** (advisor John Rickert). Nineteen freshmen took part in the Eighteenth Annual ARS Competition. First place prize was awarded to *Casimir Ksiazek*, 2nd place prize was awarded to *Anirudh Narayanan and Michael Nguyen*, and 3rd place prize was awarded to *Tyler Gonnsen*.
- **28th Annual Virginia Tech Regional Mathematics Competition** (advisor John Rickert). Thirteen Rose-Hulman students participated in this nation-wide mathematics problem solving competition held November 2006.
- **67th Annual Putnam Competition** (advisor John Rickert). In the 67th Annual William Lowell Putnam Mathematical Competition, *Robert Lemke-Oliver*, *Amanda Rohde*, *Kimi Parke*, *Angela Smiley*, and *Harry Henman* all had strong scores. There were 3,640 contestants from 508 institutions and our students scored between 390th and 600th place. 2,279 students scored 0 points.
- **23rd Mathematical Contest in Modeling** (advisor David Rader). Four teams from Rose-Hulman spent four days in February competing in this annual international modeling contest. The team of *Ted Lyman*, *Ely Spears*, and *Tom Werne* and also the team of *Nathan Lindle*, *Piotr Pelcer* and *Xiaofeng Tao* received a Meritorious Award for their papers. The team of *Robert Lemke-Oliver*, *Ian Rogers* and *Steve Torno* along with the team of *Casimir Ksiazek*, *Chris Leibs* and *Arnold Yim* received Successful Participant.

- **42nd Indiana College Mathematics Competition** (advisor John Rickert). The team of *Robert Lemke-Oliver, Hari Ravindran and Amanda Rohde* received first-place honors out of 40 teams at the 2007 ICMC held at the University of Indianapolis in March 2007. The team of *Casimir Ksiazek, Ted Lyman and Ely Spears* tied for 8th highest score. The team of *Kimi Parker, Ian Rogers and Steve (Bill) Torno* tied for 13th highest score, and the team of *Harry Henman, Tim Olmsted and Arnold Yim* tied for 14th highest score.

Student Presentations

Pi Mu Epsilon Conference at Miami University.

- *Ted Lyman*: “Pre-Images of Points in the Numerical Range”
- *Ely Spears* : “Refinable Rational Functions”

January AMS meeting in New Orleans

- Robert Lemke -Oliver and Ian Rogers present posters on REU research

24th Annual Conference on Undergraduate Mathematics

- *Brandon Borkholder* presented “A Look at the Mathematics of Automated Model Checking”
- *Stephen Dupal* presented “Optimizing 4th-order and 5th-order Explicit Runge-Kutta Formulas”
- *Adam Georgas* presented “Novel Statistical Method for Analyzing Spectroscopic Ligand Binding Data Using Matlab”
- *Hari Ravindran* presented “Galois Representations Associated to Modular Forms”
- *Ian Rogers* presented “On the Minimum Vector Rack of a Graph”
- *Ely Spears* presented “Refinability of Rational Functions”
- *Tom Werne* presented “Characterizing Holes in Wires and Plates: Inverting the Heat Equation”

Spring meeting of the MAA

- *Ely Spears* : “Refinable Rational Functions

Rose Math Seminars:

- *Brandon Borkholder* presented “The Mathematics of Model Checking and How to Approximate Manual Proofs”, April 2007
- *Nate Dorr* presented “Actuarial Mathematics”, November 2006
- *Stephen Dupal* presented “Optimizing 4th-Order and 5th-Order Explicit Runge- Kutta Formulas”, December 2006
- *Robert Lemke-Oliver* presented “Cookius Maximus”, December 2006
- *Ted Lyman* presented “Pre-Images of Points in the Numerical Range”, September 2006
- *Ian Rogers* presented “On the Minimum Vector Rank of a Graph”, December 2006
- *Ely Spears* presented “Characterizing Refinable Rational Functions”, December 2006

- *Thomas Werne* presented “Finding the Centroid of $W(A)$ ”, September 2006 and “Characterizing Holes in Wires and Plates: Inverting the Heat Equation”, December 2006

Student Awards

Clarence P. Sousley Memorial Award presented to *Amanda Rohde* and *Thomas Werne*. This is awarded to a graduating mathematics major that has demonstrated exceptional performance in their field, and is voted on by the Mathematics faculty.

Theodore Paine Palmer Award presented to *Casimir Ksiazek* for demonstrating excellence in mathematics during the freshman year.

Putnam Recognition

Robert Lemke-Oliver, and *Amanda Rohde* were recognized for a top 500 performance in the Putnam Competition. As mentioned earlier this international competition is extremely difficult, the median score being 0 points.

Modeling Competition in Mathematics Recognition

The teams of

- *Ted Lyman, Ely Spears, Tom Werne* and
- *Nathan Lindle, Piotr Pelcer, Xiaofeng Tao*

were recognized for a Meritorious standing the Modeling Competition in Mathematics

Indiana Mathematics Competition Recognition

Robert Lemke-Oliver, Hari Ravindran and *Amanda Rohde* received first-place honors out of 40 teams at the 2007 ICMC.

4. Faculty and Staff Activities

4.a Teaching, Curriculum Development, and Student Advising

Enrollments Data for the last four years:

Year	2006-07	2005-06	2004-05	2003-04
<i>Calculus/DE/Stats</i>	2409	2180	2398	2390
<i>Post Calculus/DE/Stats</i>	853	917	852	785
<i>Total</i>	3262	3097	3250	3175

Curriculum development groups The faculty is organized into four self selected interest groups according to the four concentrations of the degree program. The groups are:

- Traditional mathematics concentration –convener Jeff Leader
- Discrete applied mathematics – convener John Rickert

- Continuous applied mathematics – convener Yosi Shibberu
- Statistics/OR – convener Mark Inlow

New courses and topics courses

- MA333 Introduction of Parallel Computing–*Jeff Leader* (made a formal course this year). Considerable work done by *Jeff Leader*, student *Tom Werne* and IAIT staff member *Mitch Baker* to improve performance of software on RHIT cluster.
- MA490 -- Statistical Methods for Six Sigma. *Mark Inlow*. Developed/created new course to teach students the statistical methods used to implement Six Sigma and Design for Six Sigma paradigms. As far as I know, this is the first time a course solely dedicated to Six Sigma has been taught at Rose-Hulman. In addition, I don't know of any other undergrad courses like this. (Six Sigma is usually taught on the job or in graduate school.)
- *Yosi Shibberu* is working on curriculum material for a new course in bioinformatics

Senior Thesis / Senior Project

Math majors will be required to complete a senior project or thesis starting in the 2008-09 school year. Three students elected to take the thesis option ahead of schedule : *Amanda Rohde*, *Hari Ravindran* and *Brandon Borkholder*.

Student Advising, Mentoring, and Support

Academic Advising

- Actuarial Sciences Advisor – *Diane Evans*
- Fast Track Calculus, Summer 2006 – *G. Elton Graves/Roger Lautzenheiser*
- Freshman Advising – *Stephan Carlson, Elton Graves, Roger Lautzenheiser, Jeff Leader, John Rickert, Yosi Shibberu*
- Math Sophomore Advising – *Dave Finn*
- Math Junior Advisor – *Joshua Holden*
- Math Senior Advisor – *Jeff Leader, David Rader*
- Math Double Majors advisor – *Allen Broughton*
- Masters thesis committee member – ME Student – *Yosi Shibberu*
- Masters thesis committee member – Engineering Management Student -*Yosi Shibberu*
- Member of Masters Thesis Committee for Darin Voorhies - *Diane Evans*
- Senior Thesis Student Advisor – *David Rader, Ken McMurdy*
- Statistics Concentration Advisor - *Diane Evans*

Co-curricular Advising and support

- APO Advisor – *Steve Galinaitis*
- Department Honors and Awards – *Jeff Leader*
- Martial Arts Club Advisor – *Jeff Leader*
- Math Club Advisor – *David Finn*
- Mathematical Contest in Modeling Teams Advisor – *David Rader*

- Virginia Tech Regional Competition, Putnam Competition, Indiana Mathematics Competition -*John Rickert*
- National Society of Black Engineers, RHIT Chapter Faculty Advisor – *Yosi Shibberu*
- Pi Mu Epsilon Advisor – *Elton Graves*
- Tri-Delta Co-Advisor – *Diane Evans*

4.b Professional Development and Student Project Mentoring

Publications, Articles, and Writing

S. Allen Broughton

- “Finite Abelian Subgroups of the Mapping Class Group” with Aaron Wootton submitted to Algebraic & Geometric Topology
- “The Science of Nanotechnology” (with Jelski, Tilstra and others) in process of publication
- Pairs of Fuchsian Groups of Finite type, in preparation
- Mathematical Methods of Image Processing (revising with Kurt Bryan for publication as a text)

Kurt Bryan

- Submitted a paper with Lester Caudill, "Optimal Input Fluxes for Thermal Imaging" to the journal *Inverse Problems*
- Published paper "The \$25,000,000,000 Eigenvector: The Mathematics Behind Google", with Tanya Leise at Amherst College
- Substantially revised the MA 439 (Image Processing) course notes written by Allen Broughton and himself, in preparation for publishing them as a textbook

Stephan Carlson

- “The Quest for a Fuzzy Tychonoff Theorem,” accepted for publication in *The American Mathematical Monthly*, subject to final revisions
- Ten articles on various mathematical topics, appeared in Encyclopedia Britannica

Diane Evans

- “Conditional Probability and *Who Wants to be a Millionaire*,” published in the 2006 Joint Statistical Meeting Proceedings
- “Conditional Probability and *Who Wants to Be a Millionaire*,” submitted to a journal in March 2006
- “Benford’s Law and Major League Baseball Winning Streaks,” submitted in June 2006
- Received contract for “Computational Probability: Algorithms in the Mathematical Sciences”, Springer, to be published in 2007

David Finn

- “A Mathematician’s View of the AAAS Annual Meeting”, MAA Focus, December 2006
- “Falling Paper and Flying Business Cards”, SIAM NEWS, April/May issue 2007
- “On the shape of cookie” in preparation

- “Convexity of level curves for solutions to $\Delta(u)=f(u)$ ” in preparation

G. Elton Graves

- “How to get Engineers to Take Mathematics Courses” published by ASEE June 2006
- “Students with Calculus Credit: What Can We Do?” to be published by ASEE June 2007

Ralph Grimaldi

- The paper “Sums of k-th Summands for Jacobsthal Compositions” was published in *Congressus Numerantium*, Volume 179. [Pp. 139-159, Winnepeg, Canada, December, 2006]
- The paper “Tilings with L’s and Squares” (jointly with Phyllis Chinn and Silvia Heubach), was published in the *Journal of Integer Sequences*, Volume 10. [(2007), Article 07.2.8]

Joshua Holden

- “The graph theory of blackwork embroidery” to appear in: *Making Mathematics with Needlework*
- *Ten Papers and Ten Projects*, AK Peters, in preparation

Mark Inlow

- “Teaching the IID Assumption in Engineering Statistics I”, *Proceedings of the 2006 ASEE Annual Conference, 2006* (refereed publication)

Tanya Jajcay

- “Genius of Godel – in Pravda”, Sept. 23, 2006, in Slovak; review of the book by Rebecca Goldstein *Incompleteness: The proof and paradox of Kurt Godel*.

Jeffery Leader

- Began Textbook Manuscript—*Applied Linear Algebra*

Kenneth McMurdy

- “Fake CM and the Stable Model of $X_0(Np^3)$ ”, with R. Coleman, appeared in *Documenta Math*
- “Stable Reduction of $X_0(p^3)$ ”, with R. Coleman, submitted
- “Stable Reduction of $X_0(81)$ ”, submitted

Donald Mills

- “Some observations on subset sum representations”, *Integers* 6 (2006), A25, 7 pp. (electronic)
- “Polynomials generated by the Fibonacci sequence”, (with D. Garth, P. Mitchell, and J. Sellers), accepted to the *Journal of Integer Sequences* (pending revisions)

David Rader

- Co-authored the paper “A heuristic algorithm for a chance constrained stochastic program” with Concetta A. DePaolo., which appeared in *European Journal of Operational Research*

(V. 176 # 1, pp. 27-45)

Presentations (Rose Math Seminar listed separately at the end):

Allen Broughton

- Higher Genus Soccer Balls, ISU Math Seminar, Fall 2006
- Geometry from Chemistry INMAA Spring Meeting, 2007
- Classifying Pairs of Fuchsian Groups of Finite Type, AMS Regional Conference, Tucson, April 2007.

Kurt Bryan

- Gave four presentations at Rutgers, "Blow Up for Solutions to the Heat Equation with Nonlinear Boundary Conditions",
- "The \$25,000,000,000 Eigenvector: The Mathematics Behind Google" to the undergraduate math club
- two lectures on "Determination of Cracks from Boundary Measurements"

Bill Butske

- "Introduction to Sato-Tate", April 2007, at Wayne State University

Diane Evans

- "Conditional Probability and *Who Wants to be a Millionaire*" at the Joint Statistical Meetings in Seattle, Washington in August 2006

David Finn

- "Convexity of Level Curves for Solutions to $(u f u = \Delta$ ", AMS/MAA/SIAM Joint Meeting
- "On the Shape of a Cookie", Dewey Institute – (May 2nd, 2007)

Steve Galinaitis

- "Modeling Hysteresis", IN MAA Meeting, March 2007

G. Elton Graves

- "How to get Engineers to Take Mathematics Courses" presented at National ASEE Meeting, June 2006
- "Students with Calculus Credit: What Can We Do?", to be presented at National ASEE Conference in June, 2007

Ralph Grimaldi

- Presented a research paper on Jacobsthal Compositions at the National Mathematics meetings in New Orleans in January, 2007
- Presented a research paper on Compositions and the Alternate Fibonacci Numbers at the Southeast Conference on Combinatorics, Graph Theory, and Computing (at Florida Atlantic University) in March, 2007
- Presented two seminars on compositions at Indiana State University during the fall quarter

Joshua Holden

- "Mapping the Discrete Logarithm", Algorithmic Number Theory Symposium VII (poster

session), Technische Universität Berlin, July 25, 2006 (Joint work with Daniel R. Cloutier)

- “Where Does it Hurt? A Teaching Clinic for New and Slightly Used Faculty”, Panelist, RHIT (sponsored by RHIT Faculty Success Grant), September 13, 2006
- “Writing Projects and Rubrics in Foundational Mathematics Courses”, MAA Session on Getting Students to Discuss and to Write about Mathematics, Joint Mathematics Meetings, New Orleans, January 6, 2007
- “Mapping the Discrete Logarithm”, ISU Math & CS Research Seminar, Monday, February 19, 2007 (Joint work with Daniel R. Cloutier)
- “Diversity Matters” Speaker, RHIT Student Leader's Luncheon on the theme, January 17, 2007

Mark Inlow

- “Why Statistics?”, 2006 Statistics Career Day at IUPUI, Indianapolis, October 4, 2006
- “Graphical Methods for Teaching and Assessing the IID Assumption” 2007 Joint Mathematics Meetings, New Orleans, January 5-8, 2007
- “Teaching the IID Assumption in Engineering Statistics I” 2006 American Society for Engineering Education Annual Conference, Chicago, June 18-21, 2006

Tanya Jajcay

- Invited speaker at Polytechnic di Milano: “Amalgams of inverse semigroups”, July, 2006
- Presentation in the ISU library about mathematics and life of John Nash in connection with showing the movie A Beautiful Mind, March, 2007

Roger Lautzenheiser

- Presentation “Home on the (Numerical) Range”, RHIT Math Seminar, September 2006

Kenneth McMurdy

- “Stable Reduction of $X_0(p^n)$ – A Progress Report,” given at the AMS-MAA Joint Meetings (New Orleans), Special Session on Arithmetic Geometry

Don Mills

- “Polynomials generated by the Fibonacci numbers”, Joint Mathematics Meetings, New Orleans, LA, January 2007
- “Polynomials generated by the Fibonacci numbers”, University of Rhode Island, Kingston, RI, April 2007

Yosi Shibberu

- “Is symplectic-energy-momentum integration well-posed?”, Joint AMS, MAA and SIAM Mathematics Conference in New Orleans, January 8, 2007

Rose Math Seminar

Allen Broughton

- “Geometry from Chemistry I - Understanding Molecular Dynamics of Bucky Balls”.
- “Geometry from Chemistry II – The Geometry of Nanotubes”

Stephan Carlson

- “Fuzzy Sets and Fuzzy Topologies: Early Ideas and Obstacles,” Rose Math Seminar
- “Correct Fuzzification of Topological Spaces: Functors and the General Tychonoff Theorem,” Rose Math Seminar

David Finn

- ”Concavity, Maxima and Differential Equations”

Steve Galinaitis

- ” Modeling Hysteresis: A load dependent hysteresis model for a simple shape memory wire actuator” (2 talks)

Joshua Holden

- “How to Paint Your Way Out of a Maze”

Roger Lautzenheiser

- “Home on the (Numerical) Range”

Jeffery Leader

- “The Tucker and PARAFAC Decompositions for Three-Way Arrays”

David Rader

- “What Can You do with an NP-Hard Optimization Problem?”

Yosi Shibberu

- “Alignment of Protein Structures”

Conferences and Workshops attended

S. Allen Broughton

- Pi Mu Epsilon meeting at Miami University
- Fall and Spring Indiana MAA meetings
- Joint Math Meetings, January 2007
- Rose-Hulman Conference on Undergraduate Mathematics, March 2007 - coorganizer
- Western regional meeting of the AMS – co-organizer for a special session

Bill Butske

- Rose-Hulman Conference on Undergraduate Mathematics, March 2007

Stephan Carlson

- MathFest 2006, Knoxville, TN, August 2006
- Joint Mathematics Meetings, New Orleans, LA, January 2007
- Rose-Hulman Conference on Undergraduate Mathematics, Terre Haute, IN, March 2007

Diane Evans

- Joint Statistical Meetings (annual national statistics meetings), August 2006
- INFORMS (Institute for Operations Research and Management Science), annual national OR meetings, November 2006
- Rose-Hulman Conference on Undergraduate Mathematics, March 2007

David Finn

- INMAA Meeting Valparaiso University, Oct 13th, 2006
- INMAA Meeting University of Indianapolis, March 23rd-24th, 2007
- AMS/MAA/SIAM Joint Meeting New Orleans January 4th to 8th, 2007
- Rose-Hulman Conference on Undergraduate Mathematics, March 2007

Elton Graves

- National ASEE Meeting, June 2006
- Rose-Hulman Conference on Undergraduate Mathematics, March 2007
- National MAA Meeting, Jan 2007
- National ASEE Meeting, June 2007

Ralph Grimaldi

- Joint Mathematics Meetings, New Orleans, January 2007
- Southeast Conference on Combinatorics, Graph Theory, and Computing, Florida, March 2007
- Rose-Hulman Conference on Undergraduate Mathematics, March 2007

Joshua Holden

- Joint Mathematics Meetings, New Orleans, January 2007
- Algorithmic Number Theory Symposium VII, Technische Universit\ at Berlin, July 2006.
- Rose-Hulman Conference on Undergraduate Mathematics, March 2007

Mark Inlow

- 2006 American Society for Engineering Education Annual Conference, Chicago, June 18-21, 2006
- 50th Annual Fall Technical Conference of the American Statistical Association and the American Society for Quality, Columbus, October 12-13, 2006
- 2007 Joint Mathematics Meetings, New Orleans, January 5-8, 2007
- Rose-Hulman Conference on Undergraduate Mathematics, March 2007

Tanya Jajcay

- Steering committee meeting for European Science Foundation international programme AutoMathA (Automata, mathematics and applications)., in Venice, Italy, July 2006
- ICALP 2006 – 33rd International Colloquium on Automata, Languages and Programming, July 9-16, S. Servolo – Venice, Italy

- Rose-Hulman Conference on Undergraduate Mathematics, March 2007

Roger Lautzenheiser

- Pi Mu Epsilon meeting at Miami University – assisted two students with paper presentations
- Rose-Hulman Conference on Undergraduate Mathematics, March 2007

Jeff Leader

- Joint Math Meetings, January 2007
- SIAM Computational Science and Engineering Conference
- Rose-Hulman Conference on Undergraduate Mathematics, March 2007

Kenneth McMurdy

- AMS-MAA Joint Meetings (New Orleans)
- Rose-Hulman Conference on Undergraduate Mathematics, March 2007 - co organizer

Donald Mills

- Workshop on Polynomials Over Finite Fields , Banff, Alberta, Canada, November 2006
- Joint Mathematics Meetings, New Orleans, LA, January 2007
- Rose-Hulman Conference on Undergraduate Mathematics, March 2007

David Rader

- Fall and Spring Indiana MAA meetings
- INFORMS Fall 2006 meeting
- Rose-Hulman Conference on Undergraduate Mathematics, March 2007

John Rickert

- Indiana spring section meeting of the MAA, March 2007
- Rose-Hulman Conference on Undergraduate Mathematics, March 2007

Yosi Shibberu

- Accompanied the Rose-Hulman Chapter of the National Society of Black Engineers (NSBE) to the NSBE Fall Regional Conference in Cincinnati, Ohio, on November 11, 2006, where the Chapter participated in the NSBE Academic Technical Bowl competition
- Rose-Hulman Conference on Undergraduate Mathematics, March 2007

Other professional development and student mentoring activities

S. Allen Broughton:

- reviewed a paper on pq-hyperelliptic surfaces
- co-organized RHIT Conference on Undergraduate Mathematics
- co-organizer for a special session on Automorphisms of Curves, Western Regional Meeting of the AMS

Kurt Bryan:

- Spent January to early May at Rutgers University, working with Michael Vogelius on research
- Worked with Tom Fredman in Turku, Finland, on inverse problems related to nondestructive evaluation and give a series of 3 lectures on inverse problems in a graduate course
- Reviewed a number of the journal Inverse Problems and the SIAM journal of Mathematical Analysis, and organized a special session on "Inverse Problems for Thermal Imaging" at the Applied Inverse Problems conference to take place in June 2007 in Vancouver, BC
- His group of 4 students produced three technical reports in Rose-Hulman's Undergraduate Mathematics series, and several presented their results at the Joint Math meetings in New Orleans, and well as other conferences
- Obtained a three year renewal from the NSF for the REU program (with Dave Finn and Josh Holden), for \$186,000

Diane Evans:

- Member of Masters Thesis Committee for Darin Voorhies
- Coordinated a Quality Control tour for students to ThyssenKrupp Presta in Terre Haute during winter quarter
- Reviewed articles for the Rose-Hulman Undergraduate Mathematics Journal

David Finn:

- Organizer for Rose Math Seminar
- Referee "College Mathematics Journal"

Elton Graves:

- Organized MAA contributed paper session K5: Mathematics and Biology 2010 Building the Connections: National MA Meeting, Jan. 2007
- Program Chair Mathematics Division of ASEE. Organized all technical paper sections (5) of the Mathematics Division for the National ASEE Meeting to be held in June 2007

Joshua Holden:

- Ongoing work on graph theory related to blackwork embroidery
- Ongoing work on graph-theoretic structure of the discrete logarithm
- Judge, Undergraduate Student Poster Session, Joint Mathematics Meetings, New Orleans, January 7, 2007
- Reviewer for RHIT Undergraduate Mathematics Journal, Cryptologia, and Thomson Higher Education
- Editor, Cryptologia Editorial Board

Mark Inlow:

- Teaching the IID Assumption in Engineering Statistics I, Proceedings of the 2006 Annual ASEE Conference, 2006 (refereed publication)

Tanya Jajcay:

- Advisor for undergraduate project (semigroup theory) with Artem Yankov – freshman, CS major
- Research advisor for Swara Kopparti – talented high school student (junior, South Vigo High School); Project Generalized Difference Sets. Swara applied and, based on her results, was accepted for the prestigious highly competitive Summer Research Program at MIT
- Coadvisor Emanuele Rodaro – PhD. student at Politecnico di Milano. Theses: HNN extensions of finite inverse semigroups. Emanuele defended his theses on December 2006

Roger Lautzenheiser:

- Editor of the Mathematics Undergraduate Journal (in its 7th years of existence, there have been 118 papers and 196 authors)
- Assisted two students with presentations for their presentations at the Rose Math Seminar
- Assisted Rose student Tom Werne with his presentation at Rolls-Royce in Indianapolis

Jeffery Leader

- reviewed a paper for Applied Math. Letters

Ken McMurdy:

- Supervised senior thesis for Hari Ravindran on “Galois Representations Associated to Modular Forms”

Donald Mills:

- Wrote a chapter on polynomials formed by Fibonacci numbers for a book that will be published by the Mathematical Association of America
- Refereed research papers for IEEE Transactions on Information Theory and Integers (The Electronic Journal of Combinatorial Number Theory)
- Refereed papers for RHIT Undergraduate Mathematics Journal and PRIMUS
- Wrote a book review for Cryptologia

John Rickert:

- Coach for Rose-Hulman's four teams competing in the Indiana College Mathematics Competition administered at the spring meeting of the Indiana Section of the MAA at IUPUI. Rose-Hulman won the competition
- Coordinator for Rose-Hulman's participation in the Putnam competition
- Constructed and administered the Alfred R. Schmidt freshman mathematics competition
- Coordinates Rose-Hulman's participation in the Virginia Tech Mathematics Competition
- Served as chief judge for the regional and state Mathcounts competitions
- Proctor for college bowl at Rose-Hulman and the regional competition at Notre Dame
- One of the volunteers presenting laptop orientation to freshmen
- Chief organizer of the forty-first annual Rose-Hulman High School Mathematics Competition
- Served as a coach and organizer of the teams representing the state of Indiana at the American Regions Math League meet, to be held in June
- Has been coordinating weekly mathematical problem solving sessions for area high school students

- During the Summer of 2006, he worked as a tutor at the Research Science Institute program at MIT. One of his students from the summer was a finalist in the Intel Science Talent search

Dave Rader:

- Assistant Editor, RHIT Undergraduate Mathematics Journal

4.c Faculty and Staff Professional Service

RHIT and Math Committee Chairs

- Academic Computing Environment Review Commission – *David Rader*
- Academic Software Committee – *Allen Broughton*
- Academic Technology Committee – *Joshua Holden*
- Admissions and Standing Committee – *Elton Graves*
- Faculty Affairs Committee – *Stephan Carlson*
- Graduate Studies Committee – *Jeff Leader*
- Laptop Committee – *David Rader*
- Parallel Computing Steering Committee – *Allen Broughton*
- Math Department Curriculum Committee Chair – *David Finn*
- Statistics/OR Committee – *Mark Inlow*
- Student Affairs Committee – *John Rickert*

Other Professional Service and Outreach Activities

S. Allen Broughton:

- Math department webmaster
- Laptop orientation for Freshmen and Fast Track

Stephan Carlson

- Member of Indiana MAA Section Distinguished Service Award Selection Committee (through summer 2006)
- Member and Chair of MAA National Committee on SIGMAAs (Special Interest Groups of the MAA) (through January 2007)
- Member of MAA Coordinating Council on Meetings (through January 2007)
- Member of MAA National MathFest Site Selection Committee (term expires in 2008).
Member of MAA Strategic Planning Working Group on Professional Development (through January 2007)
- Member of MAA Committee on Panel Sessions (term expires in 2010)
- Member of MAA Committee on Sections (term expires in 2010)

Diane Evans:

- Member of the Institute Animal Care and Use Committee (IACUC)
- Member of the Employee Relations Committee

David Finn

- INMAA Executive Board Member
- Newsletter Editor

William S. Galinaitis:

- MAA, national and regional
- AMS, American Mathematical Society.
- SIAM, Society for Industrial and Applied Mathematics
- SPIE, International Society of Optical Engineering
- VAS, Virginia Academy of Science
- SIAM- SEAS, Society for Industrial and Applied Mathematics Southeastern Atlantic Section
- CAP, Civil Air Patrol

Elton Graves:

- State Director AMC 8, 10, 12
- Regional Coordinator (Francis Vigo Chapter) of MATHCOUNTS
- Site coordinator for State MATHCOUNTS competition 2007.
- Reviewed seven papers for publication by ASEE
- Reader, AP Calculus Exam
- Conductor, Early Music Sing, Joint Mathematics Meetings, New Orleans, January 7, 2007
- Assisted with Fall Laptop Orientation

Joshua Holden: Roger Lautzenheiser:

- Member of PTR Commission to review the PTR process

Donald Mills

- Directed grading efforts for RHIT High School Mathematics Contest, November 2006

David Rader:

- Public Information Officer, Indiana MAA Section
- Member, RHIT United Way Organizational Committee
- INFORMS Computing Society Education Committee (2007)

John Rickert:

- One of the volunteers presenting laptop orientation to freshmen

Yosi Shibberu:

- Participated in the annual NAACP reenactment of the Underground Railroad at St. Mary of the Woods, September 2006. Played the role of storyteller

4.d Faculty Honors and Awards

Diane Evans:

- Received the 2006 INFORMS (Institute for Operations Research and the Management Sciences) Computing Society's Prize for research excellence in the interface between operations research and computer science with her colleagues Larry Leemis, Andrew Glen, and John Drew. The research prize was for a collection of papers about their probability software called APPL ("A Probability Programming Language")

David Finn:

- His "Shape of a Cookie" was featured on NUMB3RS October 13th, 2006

4.e Membership in Interdepartmental Faculty Clusters

- *Imaging Systems Faculty:* Allen Broughton, David Finn, Joshua Holden
- *Parallel Computing Users Group:* Allen Broughton, Joshua Holden, Jeff Leader
- *Nano-Technology Text Writing Group:* Allen Broughton

5. Grants and Continuing Grant activities

- NSF-REU site -19th year (*Kurt Bryan (PI), David Finn (Co-PI) and Joshua Holden (SI)* DMS-0352940
- Undergraduate Mathematics Conference Grant for the RHIT Undergraduate Mathematics Conference, administered by the Mathematical Association of America, supported by grant DMS-0536991 from the National Science. Foundation – *Allen Broughton*
- NSF- RUI *Steve Galinaitis*
- European Science Foundation international programme AutoMathA (Automata, mathematics and applications). Member of the steering Committee – *Tanya Jajcay*

6. Departmental Programs

Fast Track Calculus: 48 students, Director Elton Graves; Instructors: Elton Graves and Roger Lautzenheiser

Rose-Hulman Undergraduate Mathematics Journal: Editor Roger Lautzenheiser, Assistant editor David Rader. (106 papers and 174 authors during its 7 years of existence)

Rose-Hulman High School Mathematics Competition: (forty-first annual). Co-organizers John Rickert, Bill Butske, Tanya Jajcay and Don Mills. Approximately 440 students participated

Rose-Hulman Undergraduate Mathematics Conference: (March 2007, 24th annual), co-organizers, Allen Broughton and Ken McMurdy. 14 student talks;, about 50 conference participants

MATHCOUNTS Regional competitions: (regional and state) Elton Graves, Regional Coordinator, Denis Radecki and William Eccles local co-organizers