

DEPARTMENT OF MATHEMATICS
Annual Report to the Board of Trustees of
Rose-Hulman Institute of Technology
1 June 07 -31 May 08

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1. Department Overview

This was a highly 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 of four faculty members to replace loss of Ken McMurdy and Don Mills, and to account for growth in the department.
- 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 close to 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 math courses “beyond the foundation” courses.
- d. Very strong participation by students in the math seminar, both as speakers and as attendees.
- e. Two students are completing undergraduate theses. One student electing to complete a senior thesis one year in advance of when the requirement becomes effective and one student graduating a year early.
- f. Continuing success in undergraduate mathematics research through student research and presentations,
 - NSF-REU (20 years),
 - Undergraduate Math conference (25 years)
 - and Undergraduate Journal (132 papers and 218 authors in the 8 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

Cara Brooks – tenure track appointment from Michigan State University

Michael Barg – one year visiting appointment coming from The George Washington University

Michael DeVasher – one year visiting appointment coming from University of Alabama

Andrea Dziubek – one year visiting appointment coming from Berlin University of Technology, Germany

John Massman – one year visiting appointment coming from South Dakota State University

Sabbaticals

G. Elton Graves - on sabbatical fall and winter quarters at Changwon National University, Changwon, South Korea, and spring quarter at Indiana University in Bloomington, IN

S. Allen Broughton – on sabbatical spring quarter at Indiana University in Bloomington, IN

3. Student and Alumni Activities

Pi Mu Epsilon Honorary Mathematics Fraternity: New members of the Rose-Hulman student body were inducted at the Spring 2008 Initiation Banquet for the Indiana Gamma Chapter of Pi Mu Epsilon. The speaker was Carl Cowen, Professor of Mathematics at Indiana University Purdue University Indianapolis

Mathematics Competitions

19th annual Alfred R. Schmidt Freshman Mathematics Competition (advisor John Rickert). Sixteen freshmen took part in the Nineteenth Annual ARS Competition. First place prize was awarded to *Kyle Wilson*, 2nd place prize was awarded to *Jenny Levey*, and 3rd place prize was awarded to *Eric Crockett and James Dalton*.

29th Annual Virginia Tech Regional Mathematics Competition (advisor John Rickert). Sixteen Rose-Hulman students participated in this nation-wide mathematics problem solving competition held November 2007. *Hari Ravindran* and *Robert Lemke-Oliver* tied for 31st place.

68th Annual Putnam Competition (advisor Kurt Bryan). In the 68th Annual William Lowell Putnam Mathematical Competition, our team of Robert Lemke-Oliver, Kimiko Parker and Harry Henman came in 24th out of 400 teams.

24th Mathematical Contest in Modeling (advisor W. Steve Galinaitis). Four teams from Rose-Hulman spent several days in February competing in this annual international modeling contest. The teams of (1) *Casimir Ksiazek, Ely Spears and Hari Ravindran*, (2) *Rose Haft and Hannah Chadd*, and (3) *Kimi Parker, Robert Lemke-Oliver and Steve Torno* were awarded Honorable Mention. The team of *Harry*

Henman, Arnold Yim, and Artem Yankov were awarded Successful Participant. **43rd Indiana College Mathematics Competition** (advisor John Rickert). Four teams competed in the 2008 ICMC administered at the spring meeting of the INMAA held at St. Mary's College in Notre Dame. The teams of (1) *Robert Lemke-Oliver and Hari Ravindran*, (2) *Steve (Bill) Torno and Kimiko Parker*, and (3) *Casimir Ksiacek, Tom Olmsted, Arnold Yim, Artem Yankov and James Dalton* finished in the top 10 teams. The team of Robert Lemke Oliver and Hari Ravindran finished second in the competition.

Student Presentations

January AMS meeting in San Diego

Ian Rogers presented "Some Results on Antidesigns" in the AMS Session on Combinatorics

25th Annual Conference on Undergraduate Mathematics

Megan Knilands presented "Numerical Beam Propagation"

Nathan Lindle presented "A Statistical Look at Mapping the Discrete Log"

Rose Math Seminars:

Robert Lemke-Oliver presented "Generalized Niven Numbers", Sept. 2007

Ely Spears presented "Models for Emergent Behavior", Oct. 2007

Casimir Ksiazek III presented "Introduction to the Life Table", Dec 2007

Ely Spears presented "Total Variation Image Restoration", Mar 2008

Student Awards

Clarence P. Sousley Memorial Award presented to *Robert Lemke-Oliver, Ian Rogers and Ely Spears*. This is awarded to graduating mathematics majors that have demonstrated exceptional performance in their field, and is voted on by the Mathematics faculty.

Theodore Paine Palmer Award presented to *Kyle Wilson* for excellence in mathematics during the freshman year.

Putnam Recognition

Robert Lemke-Oliver, Kimiko Parker and Harry Henman were recognized for their 24th place team finish out of 400 teams. *Eric Crockett* was recognized as the top freshman participant, and *Robert Lemke-Oliver and Kimiko Parker* were recognized for placing in top 500 of over 3000 individuals. As mentioned earlier this international competition is extremely difficult, the median score normally being 0 or 1 point.

Indiana Mathematics Competition Recognition

The of Robert Lemke-Oliver and Hari Ravindran was recognized for placing

second out of 40 teams at the 2008 ICMC.

4. Faculty and Staff Activities

4.a Teaching, Curriculum Development, and Student Advising

Enrollments Data for the last four years:

<i>Year</i>	<i>2007-08</i>	<i>2006-07</i>	<i>2005-06</i>	<i>2004-05</i>
<i>Calculus/DE/Stats</i>	2334	2409	2180	2398
<i>Post Calculus/DE/Stats</i>	824	853	917	852
<i>Total</i>	3158	3262	3097	3250

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:

Mathematics – 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.

Jeff Leader - *MA490 Real Analysis II* (Winter 2007-2008)
an advanced analysis course for graduate school bound math majors

Mark Inlow - *MA490 Statistical Programming Using SAS* (Spring 2007-2008).
This was the second time the course was offered at Rose-Hulman, a lot of redevelopment was needed. The scope of the course was widened to include additional material.

David Finn - *MA 490 Tensor Calculus* (Spring 2007-2008).
Second time the course was offered as a two-credit topics course, primarily for mathematics and physics majors interested in relativity. Emphasis on writing Einstein's field equations in the correct language.

Stephan Carlson - *MA 490 Set Theory and Logic*.
The course is intended as an introduction to axiomatic set theory and the elements of logic necessary to express and analyze it.

Cara Brooks - *MA 490 Introduction to Scientific Computing* (new for Fall 08-09)

Senior Thesis / Senior Project

Math majors will be required to complete a senior project or thesis starting with

those entering Rose-Hulman in 2006-2007. This year one student (*Robert Lemke Oliver*) is graduating a year early (after three years) and completing the first required thesis. Another student, *Ian Rogers*, elected to take the thesis option ahead of the required schedule.

Student Advising, Mentoring, and Support

Academic Advising

Actuarial Sciences Advisor – *Diane Evans*

Statistics Concentration Advisor - *Diane Evans*

Statistics Minor Advisor – *Mark Inlow*

Fast Track Calculus, Summer 2007 –*Kurt Bryan/Roger Lautzenheiser*

Freshman Advising –

Kurt Bryan, David Finn, W. Steve Galinaitis, Roger Lautzenheiser, John Rickert

Math Sophomore Advising – *Steve Carlson and Jeff Leader*

Math Junior Advisor – *David Finn*

Math Senior Advisor – *Josh Holden*

Math Double Majors advisor – *Allen Broughton*

Senior Thesis Student Advisors – *John Rickert, Ralph Grimaldi*

Co-curricular Advising and support

APO Advisor – *Steve Galinaitis*

Department Honors and Awards – *Josh Holden, David Finn*

Martial Arts Club Advisor – *Jeff Leader*

Math Club Advisor – *David Finn*

Mathematical Contest in Modeling Teams Advisor – *W. Steve Galinaitis*

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 – *David Finn*

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, *Algebraic & Geometric Topology* 7 (2007) 1651
- “The Science of Nanotechnology: An Introductory Text”, with L. Tilstra, R. Tanke, D. Jelski, V. French, G. Zhang, A. Popov, T. George, A. Western, Nova Science Publishers, Hauppauge NY (2007).
- “Discrete Fourier Analysis and Wavelets: Applications to Signal and Image Processing”, with Kurt Bryan to be published by Wiley, Sept. 2008.

- “Topologically Unique Maximal Elementary Abelian Group Actions on Compact Oriented Surfaces”, submitted Journal of Pure and Applied Algebra
- “Topologically Unique Maximal Elementary Abelian Group Actions on Compact Oriented Surfaces”, submitted Journal of Pure and Applied Algebra

Cara Brooks

- “A Discrepancy Principle for Local Regularization” in preparation

Kurt Bryan

- “Algorithm-independent optimal input fluxes for boundary identification in thermal imaging”, with Lester Caudill, in AIP Conference Proceedings, June 2007.
- “Discrete Fourier Analysis and Wavelets: Applications to Signal and Image Processing”, with S. A. Broughton, to be published by Wiley, Sept. 2008.

Diane Evans

- Published book entitled “Computational Probability” with co-authors John Drew, Andy Glen, and Larry Leemis. It was published as part of Springer’s International Series in Operations Research and Management Science.
- Article “Conditional Probability and *Who Wants to Be a Millionaire*” submitted to a journal in January 2007
- “Benford’s Law and Major League Baseball Winning Streaks” submitted article to a journal in August 2007

David Finn

- “Convexity of Level Curves of Semilinear Elliptic Equations”, accepted by Communications of Pure and Applied Analysis
- “The Shape of a Slice of French Bread”, submitted
- “The Shape of a Cookie”, in preparation
- “Elliptical Sessile Drops”, (with Emma Norbrothen and Meredith Perrie) in preparation

G. Elton Graves

- “Students with Calculus Credit: What Can We Do?” Published by ASEE (June 2007)

Ralph Grimaldi

- The paper “Compositions and the Alternate Fibonacci Numbers” was published in the Journal *Congressus Numerantium*, Volume 1869, December, 2007]

Joshua Holden

- “The graph theory of blackwork embroidery” In: *Making Mathematics with Needlework Ten Papers and Ten Projects*, AK Peters, 2007

Mark Inlow

- “A New, More Elementary Proof of the Central Limit Theorem” (in prep).
- “New Shapiro-Wilk Tests of Fit Using Spacings” (in prep) “

Jeffery Leader

- Article in preparation with S. Allen Broughton

Yosi Shibberu

- “What is the role of mathematical modeling in core mathematics courses for engineering students?” was accepted for publication in the 2008 Annual ASEE IL/IN Section Conference Proceedings.

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

Allen Broughton

- “The Barycenter of the Numerical Range of an Operator”, ISU Math and CS Research Seminar, November 28, 2007.
- “Elementary Abelian Group Actions on Surfaces and the Geometry of Moduli Space”, IU Geometry Seminar, November 8, 2007.

Bill Butske

- Wabash College, “Primes and Geometry”, Fall 2007
- Wayne State University, “Introduction to Sato-Tate”, Spring 2008

David Finn

- “The Shape of a Slice of French Bread”, INMAA Spring Meeting, St Mary’s College, Notre Dame

Steve Galinaitis

- “Modeling Hysteresis with a Directed Graph”, Fall Regional MAA Meeting, March 2008
- “Modeling Hysteresis with a Directed Graph”, SPIE Conference on Smart Structures and Materials

G. Elton Graves

- “Students with Calculus Credit: What Can We Do?” Given at 2007 National ASEE Meeting (June 2007)
- “What the Shortstop Sees”, a seminar on applied mathematics and use of computer algebra systems at Changwon National University, Changwon, South Korea.

Ralph Grimaldi

- Presented a minicourse on the Fibonacci and Catalan Numbers at the National Mathematics meetings in San Antonio in January, 2008
- Presented research paper on ‘The Distribution of 1’s in Jacobsthal Binary Sequences’ at the Southeast Conference on Combinatorics, Graph Theory, and Computing (at Florida Atlantic University) in March, 2008
- Invited speaker this May for Graph Theory Day (55), which will be held at Hartwick

College in Oneonta, New York. There he will give a presentation dealing with number sequences in graph theory

Joshua Holden

- "Number Theory, Polynomials, and the Advanced Encryption Standard", Mathematics and Statistics Conference on "Number Theory", Miami University, September 29, 2007.
- "The Pohlig-Hellman Exponentiation Cipher as a Bridge Between Classical and Modern Cryptography", Indiana MAA Section Meeting, Manchester College, October 27, 2007. Also given at MAA Session on Cryptogology for Undergraduates, Joint Mathematics Meetings in San Diego, January 8, 2008
- "Blackwork Embroidery and Algorithms for Maze Traversals", MAA Session on Mathematics and the Arts, Joint Mathematics Meetings, San Diego, January 9, 2008
- "Braids, Cables, and Cells: An Interesting Intersection of Mathematics, Computer Science, and Art", Illinois State MAA Section Meeting, Eastern Illinois University, April 4, 2008.
- "Mapping the Discrete Logarithm", Algorithmic Number Theory Symposium VIII (poster session), Banff Centre, Banff, Alberta, May 18--22, 2008. Joint work with Nathaniel W. Lindle.

Mark Inlow

- "Why Statistics?", 2007 Statistics Career Day at IUPUI, Indianapolis, November 6, 2007

Tanya Jajcay

- Invited speaker at Polytechnic di Milano: "Combinatorial methods in semigroups", June 2007

David Rader

- "How should we introduce OR to undergraduate students?", INFORMS Annual meeting, Seattle, WA November 2007

Yosi Shibberu

- Talk titled *Mathematical Modeling in Core Mathematics Courses for Engineers* at the 2008 Annual ASEE IL/IN Section Conference, Terre Haute, Indiana, April 3-5, 2008.

Rose Math Seminar

Kurt Bryan

- "Blow up solutions to the heat equation", September 2007

David Finn

- "Modeling a Slice of French Bread", January 2008

Tanya Jajcay

- “Generalized Difference Sets on Positive Integers”, January 2008

Conferences and Workshops attended

S. Allen Broughton

- AMS/MAA/SIAM Joint Meetings in San Diego, January 2008
- Fall meeting of the INMAA at Manchester College, October 2007
- Illiana Undergraduate Math Conference at Wabash College, October 2007
- Rose-Hulman Undergraduate Math Conference, April 2008

Cara Brooks

- Rose-Hulman Undergraduate Math Conference, April 2008
- MAA PREP workshop Wavelets and Applications: A Multidisciplinary Undergraduate Course with an Emphasis on Scientific Computing, University of St. Thomas, St. Paul, MN (June 4-7, 2008)

Kurt Bryan

- “Applied Inverse Problems”, Vancouver BC, June 2007
- Rose-Hulman Undergraduate Math Conference, April 2008

Bill Butske

- AMS Sectional Meeting, Indiana University, March 2008
- Rose-Hulman Undergraduate Math Conference, April 2008

Stephan Carlson

- MathFest 2007, San Jose, CA, August 2007
- AMS/MAA/SIAM Joint Mathematics Meetings, San Diego, CA, January 2008
- INMAA Meeting, Saint Mary’s College, Notre Dame, IN, March 2008
- Rose-Hulman Undergraduate Math Conference, April 2008

David Finn

- INMAA Meeting Manchester College, North Manchester IN, October 2007
- AMS/MAA/SIAM Joint Mathematics Meeting, San Diego, CA, Jan 2008
- AAAS Annual Meeting, Boston, MA, Feb 2008
- INMAA Spring Meeting, St. Mary’s College, Notre Dame, IN, March 2008
- Rose-Hulman Undergraduate Math Conference, April 2008

W. Steve Galinaitis

- SPIE Conference on Smart Structures and Materials, March 2008
- INMAA Fall Meeting at Manchester College, October 2007
- Rose-Hulman Undergraduate Math Conference, April 2008

Elton Graves

- National ASEE Meeting, June 2007

Ralph Grimaldi

- AMS/MAA/SIAM Joint Mathematics Meetings, San Diego, January 2008
- Southeast Conference on Combinatorics, Graph Theory, and Computing, Florida, March 2008
- Rose-Hulman Undergraduate Math Conference, April 2008

Joshua Holden

- Mathematics and Statistics Conference on "Number Theory", Miami University, September 29, 2007.
- Indiana MAA Section Meeting, Manchester College, October 27, 2007.
- AMS/MAA/SIAM Joint Mathematics Meetings, San Diego, January 8, 2008.
- Illinois MAA Section Meeting, Eastern Illinois University, April 4, 2008.

Tanya Jajcay

- AutoMathA 2007 International Conference on Automata, Mathematics and Applications, Palermo, June 18-22, 2007
- Rose-Hulman Undergraduate Math Conference, April 2008

Roger Lautzenheiser

- Illiana Undergraduate Mathematics Conference, Wabash College, October 2007
- Rose-Hulman Undergraduate Mathematics Conference, April 2008

Jeff Leader

- AMS/MAA/SIAM Joint Math Meetings, January 2008
- SIAM Conference on Optimization, Boston, May 2008

David Rader

- INFORMS annual meeting, Seattle, WA
- Indiana MAA Section Spring meeting, St. Mary's College, South Bend, IN – March 2008

Yosi Shibberu

- Rose-Hulman Undergraduate Math Conference, April 2008

Other professional development and student mentoring activities

Cara Brooks

- Helped with High School Math Contest, November 2007

S. Allen Broughton

- Sabbatical spring 08 @ IU
- Visited University of Portland for one week to work with Aaron Wootton

Bill Butske

- Co-organized the 25th Annual Rose-Hulman Undergraduate Mathematics Conference, April 2008

Kurt Bryan

- Continuing work with Michael Vogelius at Rutgers on behavior of solutions to the heat equation with nonlinear boundary conditions

Stephan Carlson

- Served on an NSF Panel to review proposals submitted to NSF's Math and Science Partnership program, Arlington, VA, April 2008

Diane Evans

- Took Quality Control students in winter 2007 to GE Aviation's Services Facilities in Terre Haute, IN for a Quality Control tour.
- Took students interested in a possible internship for the summer to Diversified Systems, Inc. in Indianapolis, IN.
- Member of Master's Thesis Committee for Darin Voorhies
- Reviewed article for the *Journal of Statistical Education*

David Finn

- Writing Articles on AAAS meeting for SIAM
- Reviewed Articles for *College Mathematics Journal*

W. Steve Galinaitis

- Session Chair at SPIE Conference

Elton Graves

- On sabbatical September 1, 2007 to present
- Taught graduate course in "Applied Mathematics" at Changwon National University, Changwon, South Korea.
- Attended graduate course "Partial Differential Equations" at Indiana University, Bloomington, Indiana.
- Mathematics consultant for the New Tech High School, Monroe County Community School Corp. Bloomington, Indiana.
- Chair Mathematics Division ASEE

Joshua Holden

- Ongoing work on graph theory related to fiber arts
- Ongoing work on graph-theoretic structure of the discrete logarithm map

Mark Inlow

- Statistical Consulting: Developed new tire tread life models and used these to compare various tire models for a major tire manufacturer under contract with TRGtech Tire Consulting LLC

Tanya Jajcay

- Working visit at Politecnico di Milano, Italy, in collaboration with professor Alessandra Cherubini, June 2007
- Collaboration with Pedro de Silva, University of Porto, Portugal: Maximal subgroups of inv. semigroups.
- Collaboration with Robert Jajcay, ISU: Difference sets.
- Collaboration with Steve Galinaitis: Representation of hysteresis with a directed graph.

Roger Lautzenheiser

- Editor of the Mathematics Undergraduate Journal

Jeffery Leader

- Continued work on textbook

John Rickert

- Constructed and administered the 19th annual Alfred R. Schmidt Freshman Mathematics Competition, November 2007
- Coordinated 29th annual Virginia Tech Regional Mathematics Competition, November 2007
- Coached four teams competing in 43rd Indiana College Mathematics Competition, March 2008

Yosi Shibberu

- Co-organized the 25th Annual Rose-Hulman Undergraduate Mathematics Conference, April 2008

4.c Faculty and Staff Professional Service

RHIT and Math Committee Membership (chairs are in bold)

Academic Technology Committee – *Yosi Shibberu, Mike McLeish*

Admissions and Standings Committee – *David Finn, Steve Galinaitis*

Animal Care and Uses – *Diane Evans*

Commission on Assessment and Student Outcomes – *David Finn*

Employee Relations - *Ralph Grimanldi*

Faculty Affairs Committee – *Josh Holden*

Graduate Studies Committee – **Jeff Leader**, *Mark Inlow*

Greek Advisory – *Diane Evans*

Hiring Committee – *Allen Broughton, Kurt Bryan, Steve Carlson, Diane Evans, David Finn, Roger Lautzenheiser*

International Programs – *Tanya Jajcay*

Laptop Committee – **David Rader**, *Allen Broughton*

Parallel Computing Steering Committee – **Allen Broughton**, *Josh Holden*

Math Department Curriculum Committee – **David Finn**, *Allen Broughton, Mark Inlow, Jeff Leader, John Rickert, Yosi Shibberu*

Student Affairs Committee – *John Rickert*

Other Professional Service and Outreach Activities

S. Allen Broughton

- Reviewed three papers

Cara Brooks

- Grader for Wabash Valley MathCounts Competition
- AMS member

Stephan Carlson

- Member of MAA National MathFest Site Selection Committee (through 2008)
- Member of MAA Committee on Panel Sessions (through 2010)
- Member of MAA Committee on Sections (through 2010)

Diane Evans

- Member of the Institute Animal Care and Use Committee (IACUC)
- Member of the Student Affairs Committee
- Member of the PTR Implementation Commission
- Member of the committee for selection of new Department Head for Engineering Management
- Reviewer for Rose-Hulman Faculty Success Grants

David Finn

- Reviewer for Math Reviews, Rose-Hulman Undergraduate Math Journal
- Referee for College Mathematics Journal
- Newsletter Editor and Executive Board Member Indiana Section of MAA
- Member Mathematical Association of America
- Member American Mathematics Society
- Member Society of Industrial and Applied Mathematics
- Member of American Association for the Advancement of Science
- Member of Subcommittee of CUPM (Committee on the Undergraduate Program in Mathematics) on Mathematics Across the Disciplines

William S. Galinaitis

- Assisted with Indiana Regional MathCounts Competition

Elton Graves

- State Director AMC 8
- State Director AMC 10/12

Joshua Holden

- Reviewer for RHIT Undergraduate Mathematics Journal, Cryptologia, and Boletín de la Sociedad Matemática Mexicana.

- Editor, Cryptologia Editorial Board.
- Member, Organizing Committee, Algorithmic Number Theory Symposium VIII, 2006--2008.

Mark Inlow

- Member, Graduate Studies Committee

Tanya Jajcay

- Member of Institute task force “New Knowledge Center”. As part of this duty, we visited Bradley University

Jeffery Leader

- Faculty Governance Commission

David Rader

- Member, INFORMS Computing Society Education Committee
- VP-Programs, INFORMS Education Forum
- Assistant Editor, RH Undergraduate Mathematics Journal
- Public Information Officer, Indiana MAA Section
- Member, RHIT United Way Organizational Committee

John Rickert

- 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 2007, worked as a tutor at the Research Science Institute program at MIT. Two of his students from the summer were finalist in the Intel Science Talent search. He will be working as tutor at the Research Science Institute program at MIT during the summer of 2008.
- Proctor for college bowl at Rose-Hulman and the regional competition Southern Illinois University -Carbondale.
- Served as chief judge for the regional Mathcounts competitions.

4.d Faculty Honors and Awards

Diane Evans Received Dean’s Outstanding Teacher Award, Spring 2007 Commencement

4.e Membership in Interdepartmental Faculty Clusters

Imaging Systems Faculty: Allen Broughton, David Finn, Joshua Holden

Parallel Computing Users Group: Allen Broughton, Joshua Holden, Jeffery Leader

Tablet PC Trial: David Finn, Steve Galiniatis, Josh Holden, Jeffery Leader, John Rickert, Dave Rader

5. Grants and Continuing Grant activities

Allen Broughton:

Participated in HHMI grant submission. Also responsible for RHIT Undergraduate Mathematics Conference grant, administered by the Mathematical Association of America, supported by grant DMS-0536991 from the National Science Foundation

Cara Brooks:

Applied for RHIT Summer Faculty Professional Development Grant

Bill Butske:

Administered Undergraduate Math Conference NSF Grant

David Finn:

Co-PI and Director for Rose-Hulman REU in Mathematics. Supervised the following projects which were presented at the Indiana Summer Undergraduate Mathematics Conference at Wabash College July 2007

- “*Investigating the Structure of a Double Bubble Cookie*” Matt Donahue (University of Arkansas) and Pam Welch (Nazareth College of Rochester)
- “*Investigating the Shape of an Elliptical Cookie*” Emma Norbrothen (Gettysburg College). Also presented at MAA Undergraduate Poster Session, Joint Mathematics Meetings, San Diego, January 2008
- “*Modeling the Shape of an Oval Cookie*” Meredith Perrie (University of Georgia)

Joshua Holden:

Senior Investigator, Rose-Hulman REU in Mathematics. Supervised the following projects, which were presented at the Indiana Summer Undergraduate Mathematics Conference, Wabash College, July 2007

- “*The Discrete Logarithm Problem and Ternary Functional Graphs*”, Max F. Brugger and Christina A. Frederick. Also presented at MAA Undergraduate Poster Session, Joint Mathematics Meetings, San Diego, January 2008, and published in the *Rose-Hulman Undergraduate Mathematics Journal*, Vol. 8, 2007.
- “*Isomorphisms of Elliptic Curves over Extensions of Finite Field*”, Matthew Niemerg. Also presented at the Illinois State MAA Section Meeting, Eastern Illinois University, April 5, 2008, and at the Rose-Hulman Undergraduate Mathematics Conference, April 11, 2008.
- “Structural Properties of the Mapping g^x to g^{x^2} ”, Philip Brunetti.

Principal Investigator, National Science Foundation group travel grant for the Eighth Algorithmic Number Theory Symposium ANTS-VIII, DMS-0801165, 2008—2009.

Applied for RHIT Summer Faculty Professional Development Grant

Applied for funding through IRPA for “Summer 2008 Projects for Tablets PCs and DyKnow Vision Software”.

Tanya Jajcay:

Member of the steering committee for the European Science Foundation international programme AutoMathA (Automata, mathematics and applications). Attended steering committee meeting, in Palermo, Italy, June 2007

Jeffery Leader:

Grant application with Zac Chambers, Marc Herniter, Philip Walter (MBSD)

Yosi Shibberu:

part of a group of faculty who organized and wrote Rose-Hulman's 2008 Howard Hughes Medical Institute's Undergraduate Science Education Proposal.

6. Departmental Programs

Fast Track Calculus (summer 2007)

38 students, Director Elton Graves; Instructors: Elton Graves and Kurt Bryan

Rose-Hulman Undergraduate Mathematics Journal:

Editor Roger Lautzenheiser, Assistant editor David Rader. (132 papers and 218 authors during its 8 years of existence)

Rose-Hulman High School Mathematics Competition: (forty-first annual). Organizers John Rickert, assisted by Allen Broughton, Cara Brooks. Approximately 440 students participated

Rose-Hulman Undergraduate Mathematics Conference: (April 2008, 25th annual), co-organizers, William Buske and Yosi Shibberu. 7 student talks, about 50 conference participants

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