



Friedman Cwatset

$$\begin{aligned} & \{000,110,101\}+110 \\ &= \{110,000,011\} \\ &= \{000,110,101\}^{(1,2)} \end{aligned}$$

Fostering Undergraduate Research in Mathematics

S. Allen Broughton - Kurt M. Bryan

Rose-Hulman Institute of Technology

April 7, 2005

Outline of Presentation

- Rose-Hulman Background
- Build it into the Program
- A Philosophy of Undergraduate Research
- Specific Programs and Outreach Efforts
- Audience Questions

Rose-Hulman Background

- private, undergraduate college, 1750 mathematics, science and engineering students
- teaching paramount, scholarship expected
- 20 math faculty, pure and applied
- 50-75 majors, most are Math & CS majors
- year long sequence in discrete math, 100 students/year average
- other strong upper division math courses
- abundant computing facilities

Building Student Research into the Regular Program

Make it a part of the curriculum

career preparation

- o traditional student research for grad school bound students
- o industrial consulting projects for industry bound students
- o a project experience is a required institutional learning outcome
- specific courses or program requirements

need faculty support and interest

- o build into teaching load
- o link to faculty scholarship/professional development
- o faculty student seminar series

need institutional support

- o all the above are supported
- o need equipment resources – just computing for math

A Philosophy of Undergraduate Math Research

“doable”, interesting problems

linked to faculty scholarship

student - student & student -faculty collaboration

computer experimentation, simulation and calculation

student presentations and writing

- Undergrad Math Conference

- Technical Report Series

consistent, though loose focus

Specific programs

Summer Programs for depth of experience

NSF REU

17 year history

Rotating participation

6 out of 20 faculty have participated

Weaver Undergraduate Research awards

Need more funds for this

Outreach efforts -1

- NSF-REU site
 - o <http://www.rose-hulman.edu/mathREU/>
 - o Research dissemination sites
 - o [cwatsets.org](http://www.cwatsets.org)
 - o [tilings.org](http://www.tilings.org)
 - o [inverse problems](http://www.inverseproblems.org)
- Undergraduate Conference
 - o <http://www.rose-hulman.edu/mathconf/>

Outreach efforts -2

- Undergraduate Math Journal
 - <http://www.rose-hulman.edu/mathjournal/>
 - [Publication results](#)
- Technical Report Series
 - <http://www.rose-hulman.edu/math/researchpubs/MSTechReps.php>

Thank You for listening!

Questions???

Shameless RHIT Mathematics Promotion Slide

Rose-Hulman Mathematics Dept

- o <http://www.rose-hulman.edu/math>

NSF-REU

- o <http://www.rose-hulman.edu/mathREU/>

- Undergraduate Math Journal

- o <http://www.rose-hulman.edu/mathjournal/>

Undergrad Math Conference March 31 & April 1,
2006

- o <http://www.rose-hulman.edu/mathconf>