

UNDERGRADUATE MATHEMATICS GRANT APPLICATION

PART I: Conference Director Information

NAME: Allison M. Pacelli

TITLE: Assistant Professor

INSTITUTIONAL AFFILIATION, ACADEMIC RANK, CONTACT INFORMATION INCLUDING OFFICE TELEPHONE, FAX, & E-MAIL:

Williams College, Assistant Professor of Mathematics

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HOME ADDRESS, TELEPHONE, E-MAIL:

ACADEMIC CREDENTIALS:

Union College, B.A., 1997

Brown University, Ph.D. in Mathematics, 2003

UNDERGRADUATE RESEARCH EXPERIENCE:

I have supervised colloquia presentations by senior Williams College students and undergraduate seminar presentations by students at Brown University. In the summer of 2005, I will direct a group of undergraduates in algebraic number theory research, as part of the SMALL REU at Williams College.

By my signature, I certify that to the best of my knowledge the information provided in all parts of my application is accurate and complete.

Signature _____ Date _____

NAME: Kristopher R. Tapp

TITLE: Assistant Professor

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Williams College, Assistant Professor of Mathematics

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ACADEMIC CREDENTIALS:

Grinnell College, B.A., 1993

University of Pennsylvania, M.A. in Mathematics, 1995

University of Pennsylvania, Ph. D. in Mathematics, 1999

UNDERGRADUATE RESEARCH EXPERIENCE:

PI on National Science Foundation grant, which includes funding for two undergraduates for one summer each. In summer of 2004, I will direct four undergraduates in Differential Geometry research, as part of the SMALL REU at Williams College.

By my signature, I certify that to the best of my knowledge the information provided in all parts of my application is accurate and complete.

Signature _____

Date _____

Part II: Structure of the Conference

Program: Williams College will host the twelfth Annual Hudson River Undergraduate Mathematics Conference (HRUMC) on a Saturday in April of 2005.

The HRUMC is a one-day mathematics conference held annually each spring semester at rotating institutions; it has been attended by students and faculty from almost 100 various universities, colleges, and community colleges in New England and beyond. The conference features 15-minute talks, the majority by students and some by faculty, and a longer keynote address by a noted mathematician. The goal of the HRUMC is to provide undergraduates with the experience of attending and/or presenting at a professional mathematics meeting. We strive to create an atmosphere which says “welcome to the mathematics community!” Student and faculty talks are scheduled together in concurrent sessions organized by topic, as at AMS meetings. Many talks describe original research, while others are expository in nature. A number of talks are accessible to first and second year students.

We are fortunate to have **Kenneth Ribet** as our keynote speaker in 2005. Ribet is famous for his role in proving Fermat’s Last Theorem, among other accomplishments.

The conference schedule next year will include a career panel, which survey responses highlighted as a successful innovation introduced at the 2004 conference. The idea is to collect professionals who have applied their recent undergraduate mathematics degrees to a variety of occupations, exemplifying the breadth of career options that Mathematics or Statistics majors have available to them.

The 2005 schedule will be modeled on the following 2004 schedule:

- 8:30 – 9:50 **Registration and Coffee**
- 9:55 – 10:50 **SESSION I:** Abstract Algebra IA (Lie Algebras), Abstract Algebra IB, Algebraic Geometry I, Analysis I, Coding Theory, Differential Equations, Fractals and Chaos I, Geometry IA, Geometry IB, Graph Theory IA, Graph Theory IB, History of Mathematics, Knot Theory, Mathematics and Art, Number Theory IA, Number Theory IB, Operations Research, Statistics I.
- 11:00 – 12:00 **Welcome and Keynote Address.** Previous keynote speakers have included Nancy Kopell, John H. Conway, Jean Taylor, Ronald L. Graham, Benoit Mandelbrot, Joseph A. Gallian, John Koch, Peter Hilton, Ingrid Daubechies, Robert Devaney, and Louis Gross.
- 12:15 – 1:30 **Lunch**
- 12:45 – 1:30 **Career Panel Discussion** with (1) Jennifer Dimmick, vice president of Marketing and Planning Systems, (2) Olga Zhushma, formerly from Knolls Engineering, (3) Rod Little, Biostatistics Department, University of Michigan, (4) Victor Roytburd, Graduate Committee Chair of the Department of Mathematical Sciences, Rensselaer Polytechnic Institute.
- 1:45 - 2:40 PM - **SESSION II:** Abstract Algebra II, Algebraic Geometry II, Analysis II, Calculus, Computer Applications, Fractals and Chaos II, Game Theory, Geometric Analysis, Geometry II, Graph Theory IIA, Graph Theory IIB, Mathematics and Biology I, Mathematics and Computer Science I, Mathematics and Games, Mathematics and Music, Number Theory IIA, Number Theory IIB, Statistics II.

- 2:45 - 3:15 PM - **Coffee Break**
- 3:20 - 4:35 - **SESSION III**: Abstract Algebra III, Algebraic Geometry III, Applied Mathematics, Combinatorics, Fractals and Chaos III, Geometry IIIA, Geometry IIIB, Knots and Graphs, Mathematics and Biology II, Mathematics and Computer Science II, Mathematics Education, Mathematics and Physics and Symmetry, Mathematics and Recreation, Mathematics, Society and the Environment, Number Theory III, Statistics III, Set Theory, Topology.

Schools from which the participants would likely be drawn: This year students and faculty from the following schools attended the HRUMC: Adirondack Community College, Albany College of Pharmacy, Bard College, Bennington College, Bryn Mawr College, Canisius College, Colby College, Colgate University, College of Mt. St. Vincent, College of St. Rose, Cornell University, Dutchess Community College, Green Mountain College, Greenville High School, Hamilton College, Hampshire College, Hartwick College, Hudson Valley Community, Ithaca College, Keene State College, Manhattan College, Marist College, Middlebury College, Mount Holyoke College, Nazareth College, NY Institute of Technology, RPI, Schenectady CCC, Siena College, Skidmore College, Smith College, Southern Ct. State University, St. Lawrence University, St. Michael's College, SUNY @ Albany, SUNY @Cortland, SUNY @ Genesco, SUNY @ New Paltz, SUNY @ Plattsburg, SUNY IT, Syracuse University, Union College, University of Maryland, University of Tennessee, US Military Academy, Vassar College, Wells College, Westfield State College, Williams College, and WPI.

Likely number of participants by category (undergraduate students, faculty, etc.): This year's 2004 conference attracted a record attendance of 461 people. Of these, 123 were faculty and 316 were undergraduate students (about 40% seniors). We anticipate a similar number of participants in 2005.

Likely number of undergraduate presentations: At this year's conference, 179 talks were presented by students and faculty from 43 different institutions. The great majority of talks were by students. We anticipate a similar number of presentations in 2005.

Method of publicizing the conference: The HRUMC has a wonderful website maintained by David Vella at Skidmore College at <http://www.skidmore.edu/academics/mcs/hrumc.htm>. This website keeps faculty and students informed about deadlines for abstract submission, the talk schedule, travel information, and the general conference goals and atmosphere. In addition, the conference has a large email list of local organizers. The local organizers will receive regular email alerting them to deadlines and providing them with posters to distribute at their home institutions and instructions about preparing students for talks. In addition, the MAA, the AMS, the AWM, and SIAM have all supported the conference in the past by advertising it in their publications.

Primary support personnel and their experience with undergraduate mathematical research presentations: The conference is organized around three organizational circles. The innermost circle each year is the Steering Committee at the host institution, which will be the Mathematics and Statistics Department at Williams College in 2005. This committee will be lead by Allison Pacelli, Satyan Devadoss and myself, with support from the entire math/stats faculty. The middle circle is the long-term Steering Committee of the HRUMC, which includes members from the conference's founding schools and from other schools that have hosted the conference. Outermost is the circle made up of the local organizers at each of the participant schools. The local organizers solicit talks from students and faculty at their institutions, make sure the speakers submit their abstracts on time, and help decide the level of the talk. (Level I talks should be accessible to a general audience of college mathematics students and faculty, while Level II talks are accessible to junior and senior mathematics students and faculty.) One of the most important responsibilities of the local organizer is to help ensure

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the high quality of the talks delivered by students from their institution. Local organizers make sure that each student has practiced her/his talk with a faculty member. The local organizer is also responsible for organizing transportation to and from their institution for those students who need it.

Part III: Financial Information

- **Anticipated Total Expenses:** We plan to raise \$11,000 for the 2005 conference. The total cost of this year's 2004 conference was about \$9000, while the 2003 conference at Union College totaled \$10,100.
- **Proposed Budget:** We anticipate the following expenditures in 2005:
 - \$5,800 -Lunch and coffee break for conference attendees
 - \$1,400 -Printing and binding of programs and promotional items
 - \$700 -Office supplies, nametags, T-shirts for volunteers
 - \$1,100 -Speaker's honorarium
 - \$600 -Speaker's travel (from California)
 - \$250 -Speaker's hotel
 - \$300 -Speaker's dinner before conference with students
 - \$400 -Classroom support personnel and set up
- **Request:** With this grant application, we are requesting \$6,000 from the MAA Undergraduate Mathematics Conferences initiative to support HRUMC in 2005.
- **Details of cost sharing:** We anticipate donations totaling about \$4500 from various sources at the host institution, including the Williams College provost, dean of faculty, and science center.
- **Past funding:** The HRUMC ~~I was funded by the~~ Alfred P. Sloan Foundation with additional funding from the National Science Foundation (NSF). HRUMC II was funded by the GE Fund and the NSF. The National Science Foundation and Skidmore College funded HRUMC III. A Hughes Medical Grant to Williams College, the New England Consortium for Undergraduate Science Education (NECUSE), and Williams College funded HRUMC IV. HRUMC V was funded by the New York Cluster of the PEW Science Program in Undergraduate Education and Union College. Sallie Mae (formerly known as the Student Loan Marketing Association, or SLMA) funded HRUMC VI, HRUMC VII, HRUMC VIII & HRUMC IX but then decided that its charitable mission changed so that it wanted to address K-12 concerns. The Andrew W. Mellon Foundation and Union College funded HRUMC X. Finally, HRUMC XI was funded by a \$5000 MAA grant, supplemented by contributions from the host institution, Mount Holyoke College.
- **Future funding:** Each year the main responsibility for fund raising to support the conference falls on the host institution. The Steering Committee for the HRUMC has always been and will continue to be on the look out for multi-year sources of funding.

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The full faculty of the mathematics department at Williams College will support and assist in hosting the HRUMC conference.

Signature _____ Date _____

**Edward Burger
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