

Patrick X. Rault

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USA and French citizenship

Education and Awards

UNIVERSITY OF WISCONSIN, Madison, WI

Ph.D. Mathematics, May 2008

Advisor: Jordan Ellenberg

Thesis Title: “On uniform bounds for rational points on rational curves and thin sets.”

NSF VIGRE Graduate Fellow

Vilas Travel Grant Award

Delta/CIRTL Certificate in Research, Teaching, and Learning, Spring 2008

COLLEGE OF WILLIAM AND MARY, Williamsburg, VA

B.S. Mathematics, Minor Physics, August 2003

Magna Cum Laude, William and Mary Prize in Mathematics

William Lowell Putnam Mathematical Competition, Top 500

Barry M. Goldwater Fellow (national award)

NSF Fellow (national award)

ADVANCED STUDY SEMESTERS

Math in Moscow (MIM), Independent University of Moscow, Russia, Spring 2003

Budapest Semesters in Mathematics (BSM), Hungary, Fall 2002

Mathematics Advanced Studies Semesters (MASS), Penn State, Fall 2001

Merit Fellow, Graduation with distinction

Teaching Highlights (details on page 2)

- ◆ Elementary school teacher preparation (Math 130), *lecturer*.
- ◆ Linear Algebra and Differential Equations, *education research project*.
- ◆ Wisconsin Emerging Scholars diversity and group-learning program.

Research Interests

- ◆ Number Theory
- ◆ Mathematics Education
- ◆ Arithmetic Geometry
- ◆ Algebraic Geometry

Publications

- ◆ Patrick Rault. **Large lecture techniques**. In preparation.
- ◆ Patrick Rault. **On uniform bounds for rational points on rational curves and thin sets**. Ph.D. Thesis.
- ◆ Charles Johnson, Yonatan Harel, Christopher Hillar, Jonathan Groves, and Patrick Rault. **Absolutely flat idempotents**. *Electron. J. Linear Algebra*, 10 (2003), 190—200.

Teaching Experience

UNIVERSITY OF WISCONSIN, Madison, WI

Trigonometry, *Lecturer*, Spring 2008

- ◆ Undergraduate course. Taught three courses of 20 students as independent instructor. Gave lectures, wrote syllabus and quizzes, assigned homework, graded course materials, held office hours, maintained course webpage.

Linear Algebra and Differential Equations, *Teaching Assistant and Researcher*, Fall 2007

- ◆ Undergraduate course. Taught four discussion sessions, wrote quizzes, graded course materials, held office hours, helped lecturer re-design course.
- ◆ Delta / CIRTLL research project on “Large Lecture Techniques” with Professor Bob Wilson.

Arithmetical Problem Solving for Elementary School Teachers, *Lecturer*, Spring 2006

- ◆ Undergraduate course for Elementary School teachers. Taught two courses of 25 students as independent instructor. Gave lectures, wrote syllabus and exams, assigned homework, graded course materials, held office hours, maintained course webpage.

Calculus-Functions of Several Variables, *Teaching Assistant and Supervisor*, Fall 2006

- ◆ Undergraduate course. Wrote quizzes, graded course materials, held office hours.
- ◆ Taught one 4 hour per week discussion session for the Wisconsin Emerging Scholars program, which “provides motivated students with an opportunity to study calculus in a challenging, friendly, multicultural environment” (cf. www.math.wisc.edu/~wes); mentored student creation of projects and presentations; supervised two Student Assistants; wrote daily worksheets. Taught one standard discussion session.

Elliptic Curves, *Grader*, Spring 2006

- ◆ Graduate course. Graded homework, provided feedback, held consultations.
- ◆ Instructor: Nigel Boston.

Calculus with Algebra and Trig. I, II, *Teaching Assistant and Supervisor*, 2005-2006.

- ◆ Undergraduate year-long course. Taught one 6 hour per week discussion session for the Wisconsin Emerging Scholars program (see above), supervised two Student Assistants, wrote daily worksheets, wrote quizzes, graded course materials, held office hours.
- ◆ Collaborated on mathematics education research about diversity in the WES program in Spring 2006.

Calculus and Analytic Geometry I, II, *Teaching Assistant*, Spring 2004 and Fall 2004

Calculus with Algebra and Trigonometry I, *Teaching Assistant*, Fall 2003

- ◆ Undergraduate courses. Taught discussion, wrote quizzes, graded materials, held office hours.

Courses I can teach

K-12 Teacher Training, Calculus, Differential Equations, Linear Algebra, Number Theory, Abstract Algebra, Algebraic Geometry, Proofs, Finite Math, Discrete Math, Geometry, Topology, Real Analysis, Complex Analysis, Statistics, and other upper and lower level courses.

Selected Education Research Presentations

“Large lecture techniques” presentation of education research project in Fall 2007.

- ◆ Invited speaker, UW Madison Teaching Improvement Program, Spring 2008.
- ◆ Joint Meetings of the AMS and MAA, 2008

Talk on Motivational Education and the Wisconsin Emerging Scholars program.

- ◆ Invited speaker, UW Madison Engineering / Chemistry TA Training, Summer 2006

Selected Mathematics Research Presentations

“On uniform bounds for rational points on rational curves and thin sets”

- ◆ Joint Mathematics Meetings of the AMS and MAA, 2008
- ◆ West Coast Number Theory Conference, Fall 2007
- ◆ UW Number Theory Seminar, Fall 2007
- ◆ Midwest Number Theory Conference for Graduate Students, Fall 2007

“The Birch and Swinnerton-Dyer Conjecture for Elliptic Curves over Function Fields”

- ◆ UW Number Theory Seminar, Fall 2006

“Counting Rational Points on Plane Curves”

- ◆ Midwest Number Theory Conference for Graduate Students at UIUC, Fall 2006

“Elliptic Curves and Abelian Varieties”

- ◆ University Of Innsbruck, Algebraic Geometry Seminar, Summer 2006

“The Heegner Point Method” Project mentored by Henri Cohen, William Stein, Jeremy Teitelbaum, and Mark Watkins.

- ◆ UW Number Theory Seminar, Spring 2006
- ◆ Arizona Winter School, Spring 2006

“Moduli Of Elliptic Curves”

- ◆ UW Number Theory Seminar, Spring 2006

“Arakelov Theory”

- ◆ UW Number Theory Seminar, Fall 2005

Teaching and Education Research Activities

UNIVERSITY OF WISCONSIN, Madison, WI

UW Teacher Training Participation

- ◆ Teaching assistant equity and diversity training, Spring 2004.
- ◆ New teaching assistants training, Fall 2003.

Delta / CIRTL Certificate in Research, Teaching, and Learning

- ◆ Received certificate after completion of certain requirements, which include two Interdepartmental Teaching-As-Research (TAR) courses, two microteaching sessions, syllabus design, teaching symposium, teaching portfolio design, Research Internship project. For more information, see www.delta.wisc.edu

Curriculum and Instruction course audit

- ◆ “Goals, Content, and Programs in Mathematics Education”

Mathematics Research Activities

Goldwater Fellowship for Undergraduate Research, 2002-2004

Research Experience for Undergraduates (REU), Penn State University, 2001.

- ◆ Geodesics in the Upper Half Plane, with Svetlana Katok and Misha Guysinsky.

Public Service

Chair of AMS Session on Algebra and Number Theory, I, at the 2008 Joint Meetings

TA Training design using Delta ideology

- ◆ Joint with Mathematics Professor Bob Wilson and Delta Professor Chris Pfund. To be implemented in Fall 2008.

TA Evaluation Committee

- ◆ Plans and carries out evaluation of TA teaching.

Committee on TA Policies and Procedures

- ◆ Assigns course-specific TA duties and pay rates.

Outdoors club

- ◆ Instruction Chair (2005-2006) in Hoofers Outing Club of 500 members.
- ◆ Designed and implemented instructional surveys to redesign curricula.
- ◆ *Honorary Lifetime Membership.*

Programming Experience

BASIC, C/C++, HTML, Magma, Maple, Mathematica, Matlab, PARI/GP, and SAGE.

References available upon request

Mathematics Research:

- ◆ Jordan Ellenberg,
ellenber@math.wisc.edu
- ◆ Nigel Boston
boston@math.wisc.edu

Teaching and Education Research:

- ◆ Concha Gomez
gomez@math.wisc.edu
- ◆ Robert Wilson
wilson@math.wisc.edu