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Employment **Visiting Assistant Professor, Duke University (2006-Present)**

Assistant Research Professor, Duke University (2003-2006)

Instructor, Princeton University (2002-2003)

VIGRE Hill Assistant Professor, Rutgers University (1999-2002)

Education **Princeton University**, Princeton, NJ.

Ph.D. in Mathematics, June, 1999. Dissertation under the supervision of Prof. Goro Shimura:
An Exact Mass Formula for Quadratic Forms over Number Fields.

State University of New York at Stony Brook, Stony Brook, NY.

B.S. in Mathematics with Departmental Honors, June, 1995.

Research Number theory, Automorphic forms, Quadratic forms.

Publications *Universal quadratic forms and the 290-theorem*, (with M. Bhargava)
(accepted – Invent. Math.)

An exact mass formula for quadratic forms over number fields,
J. Reine Angew. Math. **584** (2005), 1–27.

Local densities and explicit bounds for representability by a quadratic form
Duke Math. J. **124** (2004), no. 2, 351–388.

Some recent results about (ternary) quadratic forms,
Number theory, 147–164, CRM Proc. Lecture Notes 36, 2004.

On a local-global principle for quadratic forms,
(unpublished preprint – 2003)

On an exact mass formula of Shimura, (with W.T. Gan and J. Yu),
Duke Math. J. **107** (2001), no. 1, 103–133.

An exact mass formula for quadratic forms over number fields, Ph.D. Thesis, Spring 1999.

Finiteness theorems for primes and primitive representations, (with M. Bhargava)
(in progress)

Some factorizations of ring determinants,
(in progress)

On a local-global principle for quadratic forms over number fields,
(in progress)

Software **C++**, **MAGMA** – developed routines which compute quadratic form local densities at all primes, determines all numbers represented by a positive definite integer-valued quadratic form in 4 variables, and establishes simple finiteness theorems.

SAGE (with W. Stein) – packaged all of the above routines in a nice interface for broad accessibility and ease of use. (in progress)

Awards and Prizes **National Science Foundation Grant DMS-0603976 (Aug. 2006 – Aug. 2009)**

NSA Young Investigator Grant H98230-04-1-0076 (Feb. 2005 – Aug. 2006)

Alfred P. Sloan Dissertation Fellow (1998–1999)

National Science Foundation Graduate Fellow (1995–1998)

Invited Talks **Exact formulas for representing a number by a quadratic form**
University of Georgia, Athens (November 2006)
Duke University Graduate/Faculty Seminar (October 2006)
MSRI Summer School on Computing with Modular Forms (August 2006)
PROMYS Program at Boston University (July 2006)

The 290-Theorem and finiteness theorems for quadratic forms
University of Georgia, Athens (November 2006)
AMS Special Session at University of Arkansas (November 2006)
University of British Columbia (October 2006)
University of Washington (October 2006)
Boston University (November 2005)

Finiteness theorems and representing numbers by a quadratic form
University of Chicago (June 2005)
University of Michigan (April 2005)
Harvard Basic Notions Seminar (February 2005)
Duke Algebraic Geometry Seminar (September 2004)

The cuspidal structure of certain ternary theta functions
AMS Special Session on L -functions at Western Kentucky University (March 2005)

On a local-global principle for ternary quadratic forms
Harvard Modular Forms Seminar (March 2003)
Duke Algebraic Geometry Seminar (November 2002)
Park City Math Institute (July 2002)
Canadian Number Theory Association Meeting VII (May 2002)

What numbers can be represented by a quadratic form?
Princeton/IAS Number Theory Seminar (February 2001)

An exact mass formula for orthogonal groups
Penn State Algebra Seminar (February 1999)
Princeton Algebra Seminar (December 1998)

Mentoring **PROMYS Research Mentor – (Boston University – Summer 2006)**
Supervised three research projects for small groups of returning high-school students on “Quaternions”, “Class Numbers”, and “Finiteness Theorems”, which involved daily group meetings and individual discussions about these topics for about 3 weeks.

Mayank Varia – (Duke – Fall 2004, Spring 2005)
Supervised a two semester reading course in modular forms and related topics, culminating in a senior thesis “Explicit computation of the L -function of a Kummer Surface” receiving high distinction.

Mandy Frese – (Duke – Fall 2004, Spring 2006)
Supervised a two semester reading course on Elliptic Curve Cryptography.

Number Theory Course Projects (Duke – Spring 2004, 2005, 2006)
Supervised a final project for each student in a 5–15 student class which explained/proved a major theorem in Number Theory. This involved weekly 30-60 minute individual meetings with each student to discuss their project for the second half of the semester.

VIGRE rotation for graduate students (Rutgers – Fall 2000)
Designed and advised a reading course for two graduate students on p -adic numbers and their applications.

Formal Teaching Experience **Instructor at Duke University (2003–Present)**
Taught Combinatorics, Linear algebra, Multi-variable Calculus (2 semesters), Number Theory (3 semesters), and introduced/taught a Freshman seminar in Cryptography. All courses received several review sheets, which are available online with the tests and solutions.

Instructor at Princeton University (2002 – 2003)
Redesigned and Coordinated the Calculus I course with 10 sections and about 200 students (Fall 2002). This involved curriculum changes, creating numerous review problems and a course webpage, and teaching weekly review sessions in addition to one section of the course.

Instructor at Rutgers University (1999 – 2002)
Taught two semesters of calculus to about 25 students (Fall 1999 – Spring 2000).
Developed and taught a class in Cryptography to non-math majors (Fall 2000 – Present), including creation of a web page with lecture notes, homeworks, and other course resources.
Taught one semester of linear algebra to about 25 students (Spring 2002).

Instructor at Princeton University (1998 – 1999)

Taught one section of first year calculus to freshman and sophomore undergraduates.

**Informal
Teaching
Experience**

Several talks at Graduate/Faculty Seminar on p -adic numbers (Duke – Fall 2005)

Gave two talks on “The p -adic way of life”, describing what p -adic numbers are, the basics of p -adic analysis, and how they help us to understand the Riemann zeta function $\zeta(s)$.

Working Seminar on Jaquet-Langlands Theory (Princeton – Fall 2002)

Gave several lectures in an informal graduate student seminar describing some of the basics of Jaquet-Langlands theory.

Working Seminar on Automorphic L -functions (Princeton – Summer 2001)

Main speaker at a graduate student seminar for those interested in the spectral theory of automorphic forms contained in Bump’s book “Automorphic forms and representations”.

Co-organized a working seminar on basic algebraic geometry (Rutgers – Fall 2000)

Main speaker at a graduate student seminar to assist those trying to learn algebraic geometry.

Rutgers Instructional Technology Summer Institute (Summer 2000)

Participated in an invited workshop on the use of computers and technology in teaching, sponsored by the Teaching Excellence Center.

Participated in teaching seminar (Princeton – Fall 1997, Spring 1998)

Teaching Seminar with Frank Morgan, Visiting Distinguished Teaching Professor.

Participated in HIS520 teaching seminar (Princeton – Fall 1997)

A semester-long course on teaching with a focus on evaluation of personal strengths and weaknesses.

Teaching in Princeton Regional School District (Princeton – Fall 1997, Fall 1998)

Elementary lectures on “Computing the Euler characteristic on Balloons”.

Counselor at the PROMYS program at Boston University (Summers, 1992 – 95)

An intense 6 week program in number theory for advanced high school students with a focus on self-discovery and learning to think independently about hard problems.

Other

Co-organized the Princeton Graduate Student Seminar (1996 – 1998)

A seminar where graduate students speak about their work and/or topics of interest.