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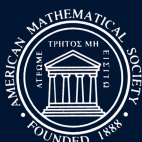
CRM PROCEEDINGS & LECTURE NOTES

Centre de Recherches Mathématiques
Université de Montréal

Number Theory

Canadian Number Theory
Association VII, Montréal,
May 19–25, 2002

Hershy Kisilevsky
Eyal Z. Goren
Editors



American Mathematical Society

Number Theory

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The Centre de Recherches Mathématiques (CRM) of the Université de Montréal was created in 1968 to promote research in pure and applied mathematics and related disciplines. Among its activities are special theme years, summer schools, workshops, postdoctoral programs, and publishing. The CRM is supported by the Université de Montréal, the Province of Québec (FCAR), and the Natural Sciences and Engineering Research Council of Canada. It is affiliated with the Institut des Sciences Mathématiques (ISM) of Montréal, whose constituent members are Concordia University, McGill University, the Université de Montréal, the Université du Québec à Montréal, and the Ecole Polytechnique. The CRM may be reached on the Web at www.crm.umontreal.ca.



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List of Speakers

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Weierstrass points on modular curves and supersingular j -invariants
- Akbary, Amir** (University of Lethbridge)
Large divisors of Fourier coefficients of modular forms
- Alaca, Saban** (Carleton University)
 p -integral bases of a quartic field defined by a trinomial
- Bennett, Michael** (University of British Columbia)
Classical Diophantine problems via Galois representations and modular forms
- Berger, Laurent** (Brandeis University)
 p -adic representations
- Bertin, Marie-José** (Université Pierre et Marie Curie)
Mesure de Mahler et régulateur elliptique
- Besser, Amnon** (Ben-Gurion University)
 p -adic Arakelov theory on curves
- Bhargava, Manjul** (Princeton University)
The representation of integers by quadratic forms
- Borwein, Jonathan** (Simon Fraser University)
Dirichlet series of squares of sums of squares
- Boxall, John** (Université de Caen)
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- Boyd, David W.** (University of British Columbia)
 A -polynomials and Mahler's measure
- Boylan, Matthew** (University of Wisconsin)
Exceptional congruences for the coefficients of certain eta-product newforms
- Brownawell, Dale** (Penn State University)
Algebraic independence over function fields
- Bruin, Nils** (Simon Fraser University)
Using towers of 2-covers of hyperelliptic curves to find rational points
- Bugeaud, Yann** (Université Louis Pasteur)
Diophantine approximation and Hausdorff dimension
- Burns, David** (King's College London)
On the equivariant Tamagawa number conjecture for Tate motives

- Carter, James E.** (College of Charleston)
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- Chen, Imin** (Simon Fraser University)
Elliptic curves with non-split mod p^2 representations
- Choi, Kwok-Kwong Stephen** (Simon Fraser University)
On Dirichlet series for sums of squares
- Cohen, Henri** (Université de Bordeaux)
Counting discriminants of number fields
- Cojocaru, Alina Carmen** (Princeton University)
*Square-free orders for CM elliptic curves modulo p and
The square sieve and the Lang–Trotter conjecture*
- Conrad, Brian** (University of Michigan)
Multivariate Bateman–Horn conjecture
- Consani, Caterina** (University of Toronto)
Archimedean fibers and non-commutative geometry
- Cremona, John** (University of Nottingham)
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- Darmon, Henri** (McGill University)
A fourteenth lecture on Fermat’s last theorem
- Debes, Pierre** (Université de Lille 1)
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- Del Corso, Ilaria** (Università di Pisa)
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- Deninger, Christopher** (Universität Münster)
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- Duke, William** (University of California, Los Angeles)
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- Dvornicich, Roberto** (Università di Pisa)
On polynomials taking small values at integral arguments
- Edixhoven, Sebastiaan J.** (Université de Rennes)
On mod p modular forms of weight one
- Elder, G. Griffith** (University of Nebraska, Omaha)
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- Fastenberg, Lisa** (Pace University)
Computing Mordell–Weil ranks of cyclic covers of elliptic surfaces
- Frechette, Sharon** (College of the Holy Cross)
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- Friedlander, John** (University of Toronto)
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- Fukshansky, Lenny** (University of Texas, Austin)
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- Goss, David** (The Ohio State University)
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- Granville, Andrew** (Université de Montréal)
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- Gurak, Stan** (University of San Diego)
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- Hanke, Jonathan** (Rutgers University)
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- Herrmann, Emanuel** (Universität des Saarlandes)
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- Hirabayashi, Mikihiro** (Kanazawa Institute of Technology)
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- Hooper, Jeff** (Acadia University)
Chinburg invariants and generalized quaternion group
- Huard, James G.** (Canisius College)
Sums of sixteen and twenty-four triangular numbers
- Iovita, Adrian** (Concordia University)
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- James, Kevin** (Clemson University)
The Lang–Trotter conjecture for elliptic curves with rational 3-torsion
- Jimbo, Henri Claver** (Advanced Research Center for Science & Engineering)
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- Jones, Lenny** (Shippensburg University)
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- Khare, Chandrashekhar** (University of Utah)
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- Kim, Henry** (University of Toronto)
Applications of the functorial symmetric cube and symmetric fourth
- Knafo, Emmanuel** (University of Toronto)
Variance of distribution of almost primes in arithmetic progressions
- Knapp, Michael** (University of Rochester)
Systems of additive equations over p -adic field
- Kumchev, Angel** (University of Toronto)
Distribution of primes in arithmetic progressions and short intervals
- Kuwata, Masato** (Kanagawa Institute of Technology)
Vanishing of twisted L -functions of an elliptic curve and rational points on $K3$ surfaces
- Lagarias, Jeffrey** (AT&T Labs—Research)
Wavelets, tilings and number theory
- Laurent, Michel** (Université de la Méditerranée)
Inequalities of Liouville’s type on a curve
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Preface

The seventh meeting of the Canadian Number Theory Association was held in Montréal, Québec, Canada during the week of May 19–25, 2002. It took place at the Centre de Recherches Mathématiques (CRM) on the campus of the Université de Montréal (UdeM).

The Canadian Number Theory Association (CNTA) was founded in 1987 at the International Number Theory Conference at Laval University. The purpose of the CNTA is to enhance and promote learning and research in Number Theory, particularly in Canada. To advance these goals the CNTA organizes major international conferences, with the aim of exposing Canadian students and researchers to the latest developments in number theory worldwide. The previous meetings have been held in Banff (1988), Vancouver (1989), Kingston (1991), Halifax (1994), Ottawa (1996) and Winnipeg (1999). These have been high quality conferences which have had wide participation of the international number theory community.

The conference was organized into several themes comprising the main directions of current research in number theory. There were sessions in Algebraic Number Theory, Analytic Number Theory, Arithmetic Algebraic Geometry, Computational Number Theory and Diophantine Analysis and Approximation. Each session had lectures exposing the recent main developments in the area, and others presenting new research results.

There were 186 participants representing 15 different countries, and 115 speakers. This volume is a collection of refereed articles selected from those presented at CNTA VII and is a cross section of current research in number theory. It contains expository articles as well as research articles and is aimed at an audience of active researchers as well as those entering the field.

A highlight of the meeting was the award of the second Ribenboim Prize to Henri Darmon. We were very pleased that this award was presented by Andrew Granville, the only previous recipient, and by Paulo Ribenboim.

We would like to thank the CRM and the Number Theory Foundation for their generous support. We also want to express our gratitude to the staff of the CRM, in particular Louis Pelletier, Louise Letendre and André Montpetit, for ensuring the smooth functioning of the meeting. Finally we thank the students and session organizers M. Kolster (Algebraic Number Theory), K. S. Williams (Analytic Number Theory), E. Z. Goren (Arithmetic Algebraic Geometry), G. Walsh (Computational Number Theory), and D. Roy (Diophantine Analysis and Approximation) for their selfless work in making the conference a success.

Hershy Kisilevsky and Eyal Z. Goren
CNTA VII organizers
Concordia University and McGill University, Montréal
March 2004

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This volume contains a collection of articles from the meeting of the Canadian Number Theory Association held at the Centre de Recherches Mathématiques (CRM) at the University of Montreal. The book represents a cross section of current research and new results in number theory. Topics covered include algebraic number theory, analytic number theory, arithmetic algebraic geometry, computational number theory, and Diophantine analysis and approximation. The volume contains both research and expository papers suitable for graduate students and researchers interested in number theory.

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