Contents

Preface v

Photo: WIN—Women In Numbers, November 2008 ix

Workshop Participants and Affiliations at the Time of the Workshop x

PART I – MODULI SPACES AND SHIMURA CURVES

Hilbert Modular Variety Computations 3
HELENgrundman

Contributions to Shimura Curves 15
Pilar Bayer

Igusa Class Polynomials, Embedding of Quartic CM Fields, and Arithmetic Intersection Theory 35
HELEN Grundman, Jennifer Johnson-Leung, Kristin Lauter, Adriana Salerno, Bianca Viray, and Erika Wittenborn

l-Adic Étale Cohomology of PEL Type Shimura Varieties with Non-Trivial Coefficients 61
Elena Mantovan

PART II – CURVES AND JACOBIANS OVER FINITE FIELDS

Pairings on Hyperelliptic Curves 87
Jennifer Balakrishnan, Juliana Belding, Sarah Chisholm, Kirsten Eisenträger, Katherine E. Stange, and Edlyn Teske

Biased Statistics for Traces of Cyclic p-Fold Covers over Finite Fields 121
Alina Bucur, Chantal David, Brooke Feigon, and Matilde Lalín

The ℓ-Rank Structure of a Global Function Field 145
Lisa Berger, Jing Long Hoelscher, Yoonjin Lee, Jennifer Paulhus, and Renate Scheidler
PART III – GALOIS COVERS OF FUNCTION FIELDS IN POSITIVE CHARACTERISTIC

A Survey of Galois Theory of Curves in Characteristic \( p \)
Rachel Pries and Katherine Stevenson 169

Covers of the Affine Line in Positive Characteristic with Prescribed Ramification
Irene I. Bouw 193

Semi-Direct Galois Covers of the Affine Line
Linda Gruendken, Laura Hall-Seelig, Bo-Hae Im, Ekin Ozman, Rachel Pries, and Katherine Stevenson 201

PART IV – ZETA FUNCTIONS OF GRAPHS

Looking into a Graph Theory Mirror of Number Theoretic Zetas
Audrey Terras 213

Zeta Functions of Group Based Graphs and Complexes
Wen-Ching W. Li 225

Ramified Covers of Graphs and the Ihara Zeta Functions of Certain Ramified Covers
Beth Malmskog and Michelle Manes 237

PART V – OTHER TOPICS

Zeros of Classical Eisenstein Series and Recent Developments
Sharon Anne Garthwaite, Ling Long, Holly Swisher, and Stephanie Treneer 251

On the \( \mu \)-Invariant in Iwawasa Theory
Sujatha Ramdorai 265

Galois Representations and the Tame Inverse Galois Problem
Sara Arias-de-Reyna and Núria Vila 277