

# Contents

Chapter 1. Introduction	1
Chapter 2. Selmer complexes	15
Chapter 3. The refined Birch and Swinnerton-Dyer conjecture	27
Chapter 4. Periods and Galois–Gauss sums	35
Chapter 5. Local points on ordinary varieties	39
Chapter 6. Classical Selmer complexes and refined BSD	49
Chapter 7. Euler characteristics and Galois structures	65
Chapter 8. Abelian congruence relations and module structures	73
Chapter 9. Abelian congruence relations and height pairings	87
Chapter 10. Height pairing comparisons	103
Chapter 11. Modular symbols	115
Chapter 12. Heegner points	125
Appendix A. Refined BSD and equivariant Tamagawa numbers	133
Appendix B. Poitou–Tate duality	141
Appendix C. Bockstein homomorphisms	149
Bibliography	151