## **Contents - Part I**

## **Lattice-Based Cryptography**

Sieving for Shortest Vectors in Lattices Using Angular Locality-Sensitive Hashing	3
Thijs Laarhoven	3
Coded-BKW: Solving LWE Using Lattice Codes	23
An Improved BKW Algorithm for LWE with Applications to Cryptography and Lattices	43
Provably Weak Instances of Ring-LWE	63
Cryptanalytic Insights	
Links Among Impossible Differential, Integral and Zero Correlation Linear Cryptanalysis	95
On Reverse-Engineering S-Boxes with Hidden Design Criteria or Structure Alex Biryukov and Léo Perrin	116
Capacity and Data Complexity in Multidimensional Linear Attack	141
Observations on the SIMON Block Cipher Family	161
Modes and Constructions	
Tweaking Even-Mansour Ciphers	189
Multi-key Security: The Even-Mansour Construction Revisited  Nicky Mouha and Atul Luykx	209



Reproducible Circularly-Secure Bit Encryption: Applications and Realizations	224
Multilinear Maps and IO	
Zeroizing Without Low-Level Zeroes: New MMAP Attacks and Their Limitations	247
New Multilinear Maps Over the Integers	267
Constant-Round Concurrent Zero-Knowledge from Indistinguishability Obfuscation	287
Indistinguishability Obfuscation from Compact Functional Encryption Prabhanjan Ananth and Abhishek Jain	308
Pseudorandomness	
Efficient Pseudorandom Functions via On-the-Fly Adaptation	329
The Iterated Random Permutation Problem with Applications to Cascade Encryption	351
The Exact PRF Security of Truncation: Tight Bounds for Keyed Sponges and Truncated CBC	368
An Algebraic Framework for Pseudorandom Functions and Applications to Related-Key Security	388
Block Cipher Cryptanalysis	
Integral Cryptanalysis on Full MISTY1	413
New Attacks on Feistel Structures with Improved Memory Complexities Itai Dinur, Orr Dunkelman, Nathan Keller, and Adi Shamir	433

Contents – Part I	XIII
Known-Key Distinguisher on Full PRESENT	455
Key-Recovery Attack on the ASASA Cryptosystem with Expanding	
S-Boxes	475
Integrity	
Online Authenticated-Encryption and its Nonce-Reuse Misuse-Resistance Viet Tung Hoang, Reza Reyhanitabar, Phillip Rogaway, and Damian Vizár	493
Relational Hash: Probabilistic Hash for Verifying Relations, Secure	<b>7.1.</b> 0
Against Forgery and More	518
Explicit Non-malleable Codes Against Bit-Wise Tampering	520
and Permutations	538
Assumptions	
Cryptanalysis of the Co-ACD Assumption	561
Last Fall Degree, HFE, and Weil Descent Attacks on ECDLP	581
A Quasipolynomial Reduction for Generalized Selective Decryption	
on Trees	601
Hash Functions and Stream Cipher Cryptanalysis	
Practical Free-Start Collision Attacks on 76-step SHA-1	623
Fast Correlation Attacks over Extension Fields, Large-Unit Linear Approximation and Cryptanalysis of SNOW 2.0  Bin Zhang, Chao Xu, and Willi Meier	643
Cryptanalysis of Full Sprout	663

Higher-Order Differential Meet-in-the-middle Preimage Attacks on SHA-1 and BLAKE	
Implementations	
Decaf: Eliminating Cofactors Through Point Compression	705
Actively Secure OT Extension with Optimal Overhead	724
Algebraic Decomposition for Probing Security	742
Consolidating Masking Schemes	764
Author Index	785

## **Contents - Part II**

Multiparty Computation 1	Mu	ıltipa	rty	Computation	I
--------------------------	----	--------	-----	-------------	---

Multiparty Computation	3
Concurrent Secure Computation via Non-Black Box Simulation Vipul Goyal, Divya Gupta, and Amit Sahai	23
Concurrent Secure Computation with Optimal Query Complexity	43
Constant-Round MPC with Fairness and Guarantee of Output Delivery S. Dov Gordon, Feng-Hao Liu, and Elaine Shi	63
Zero-Knowledge	
Statistical Concurrent Non-malleable Zero-Knowledge from One-Way Functions	85
Implicit Zero-Knowledge Arguments and Applications to the Malicious Setting	107
Impossibility of Black-Box Simulation Against Leakage Attacks	130
Efficient Zero-Knowledge Proofs of Non-algebraic Statements with Sublinear Amortized Cost	150
Theory	
Parallel Hashing via List Recoverability	173
Cryptography with One-Way Communication	191

(Almost) Optimal Constructions of UOWHFs from 1-to-1, Regular One-Way Functions and Beyond	209
Signatures	
Practical Round-Optimal Blind Signatures in the Standard Model Georg Fuchsbauer, Christian Hanser, and Daniel Slamanig	233
Programmable Hash Functions Go Private: Constructions and Applications to (Homomorphic) Signatures with Shorter Public Keys	254
Structure-Preserving Signatures from Standard Assumptions, Revisited Eike Kiltz, Jiaxin Pan, and Hoeteck Wee	275
Short Group Signatures via Structure-Preserving Signatures: Standard Model Security from Simple Assumptions	296
Multiparty Computation II	
Efficient Constant Round Multi-party Computation Combining BMR and SPDZ	319
Round-Optimal Black-Box Two-Party Computation	339
Secure Computation with Minimal Interaction, Revisited	359
PoW-Based Distributed Cryptography with No Trusted Setup	379
Non-signaling and Information-Theoretic Crypto	
Multi-prover Commitments Against Non-signaling Attacks  Serge Fehr and Max Fillinger	403
Arguments of Proximity [Extended Abstract]	422
Distributions Attaining Secret Key at a Rate of the Conditional  Mutual Information	443

Contents – Part II	хуп
Privacy with Imperfect Randomness	463
Attribute-Based Encryption	
Communication Complexity of Conditional Disclosure of Secrets and Attribute-Based Encryption	485
Predicate Encryption for Circuits from LWE	503
Bilinear Entropy Expansion from the Decisional Linear Assumption Lucas Kowalczyk and Allison Bishop Lewko	524
New Primitives	
Data Is a Stream: Security of Stream-Based Channels	545
Bloom Filters in Adversarial Environments	565
Proofs of Space	585
Fully Homomorphic/Functional Encryption	
Quantum Homomorphic Encryption for Circuits of Low T-gate Complexity Anne Broadbent and Stacey Jeffery	609
Multi-identity and Multi-key Leveled FHE from Learning with Errors Michael Clear and Ciarán McGoldrick	630
From Selective to Adaptive Security in Functional Encryption	657
A Punctured Programming Approach to Adaptively Secure Functional Encryption	678
Multiparty Computation III	
Secure Computation from Leaky Correlated Randomness  Divya Gupta, Yuval Ishai, Hemanta K. Maji, and Amit Sahai	701

## XVIII Contents - Part II

via Secure SIMD Circuits	721
Large-Scale Secure Computation: Multi-party Computation for (Parallel) RAM Programs	742
Incoercible Multi-party Computation and Universally Composable Receipt-Free Voting	763
Author Index	781