
Contents

Introduction to post-quantum cryptography

<i>Daniel J. Bernstein</i>	1
1 Is cryptography dead?	1
2 A taste of post-quantum cryptography	6
3 Challenges in post-quantum cryptography	11
4 Comparison to quantum cryptography	13

Quantum computing

<i>Sean Hallgren, Ulrich Vollmer</i>	15
1 Classical cryptography and quantum computing	15
2 The computational model	19
3 The quantum Fourier transform	22
4 The hidden subgroup problem	25
5 Search algorithms	29
6 Outlook	31
References	32

Hash-based Digital Signature Schemes

<i>Johannes Buchmann, Erik Dahmen, Michael Szydło</i>	35
1 Hash based one-time signature schemes	36
2 Merkle's tree authentication scheme	40
3 One-time key-pair generation using an PRNG	44
4 Authentication path computation	46
5 Tree chaining	69
6 Distributed signature generation	73
7 Security of the Merkle Signature Scheme	81
References	91

Code-based cryptography

<i>Raphael Overbeck, Nicolas Sendrier</i>	95
1 Introduction	95
2 Cryptosystems	96

VIII Contents

3	The security of computing syndromes as one-way function	106
4	Codes and structures	116
5	Practical aspects	127
6	Annex	137
	References	141

Lattice-based Cryptography

	<i>Daniele Micciancio, Oded Regev</i>	147
1	Introduction	147
2	Preliminaries	152
3	Finding Short Vectors in Random q -ary Lattices	154
4	Hash Functions	157
5	Public Key Encryption Schemes	165
6	Digital Signature Schemes	180
7	Other Cryptographic Primitives	185
8	Open Questions	186
	References	187

Multivariate Public Key Cryptography

	<i>Jintai Ding, Bo-Yin Yang</i>	193
1	Introduction	193
2	The Basics of Multivariate PKCs	194
3	Examples of Multivariate PKCs	198
4	Basic Constructions and Variations	202
5	Standard Attacks	215
6	The Future	229
	References	234

	Index	243
--	------------------------	-----



<http://www.springer.com/978-3-540-88701-0>

Post-Quantum Cryptography

Bernstein, D.J.; Buchmann, J.; Dahmen, E. (Eds.)

2009, X, 246 p., Hardcover

ISBN: 978-3-540-88701-0