

MAKE AND BREAK "UNBREAKABLE" CIPHERS

# Cryptanalysis of Number Theoretic Ciphers

**NEW!****Samuel S. Wagstaff**

PURDUE UNIVERSITY, CENTER FOR EDUCATION RESEARCH IN INFORMATION ASSURANCE AND SECURITY (CERIAS), WEST LAYFAYETTE, INDIANA, USA

At the heart of modern cryptographic algorithms lies computational number theory. Whether you're encrypting or decrypting ciphers, a solid background in number theory is essential for success. Written by a number theorist and practicing cryptographer, **Cryptanalysis of Number Theoretic Ciphers** takes you from basic number theory, through the inner workings of ciphers and protocols, to their strengths and weaknesses.

The first part of the book provides the mathematical background needed in cryptography as well as definitions and simple examples from cryptography. It includes summaries of elementary number theory and group theory, as well as common methods of finding or constructing large random primes, factoring large integers, and computing discrete logarithms. Part Two describes a selection of cryptographic algorithms, most of which use number theory. Finally the book presents methods of attack on the cryptographic algorithms and assesses their effectiveness. For each attack method the author lists the systems it applies to and tells how they may be broken with it. If a problem can be avoided, he tells how to avoid it.

Computational number theorists are some of the most successful cryptanalysts against public key systems. **Cryptanalysis of Number Theoretic Ciphers** builds a solid foundation in number theory and shows you how to apply it not only when breaking ciphers, but also when designing ones that are difficult to break.

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- Describes various known ways to break certain ciphers and other cryptosystems — including some private key ciphers, some signatures, and some protocols — and assesses their effectiveness
- Lists and explains each pitfall you may encounter
- Provides numerous examples of ciphers in use today and describes many algorithms in pseudocode for easy programming
- Presents cryptosystems as practical, workable algorithms, not just as oversimplified mathematical objects

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