This talk will be an overview of secure communication protocols, including the following topics:

- **Zero knowledge proof protocols using graph theory.**
  - How does Alice prove to Bob that she is in fact Alice, without giving Bob enough information to allow Bob to prove to Carol that Bob is in fact Alice?

- **Key creation protocol using exponentiation in a finite field and the difficulty of calculating discrete logarithms in finite fields.**
  - How do Alice and Bob establish a cryptologic key over an unsecure channel, without giving Eve, the eavesdropper, enough information to allow Eve to figure out the key?

- **Secure communication without a shared crypto key using the difficulty of factoring large composite numbers having two large prime factors.**
  - How do Alice and Bob establish secure communication over an unsecure channel, without a shared crypto key and without public key cryptosystem infrastructure?

- **Digital signatures.**
  - How to sign an electronic document such that a court of law can determine that the signature is authentic, not forgeable, not reuseable, cannot be repudiated, and that the document has not been altered?

- **Message digests and message authentication codes using one-way hash functions.**
  - How do you make sure a file has not been altered?

- **Secure communication without a shared crypto key using the difficulty of factoring large composite numbers having two large prime factors.**
  - How does the RSA public key cryptosystem work?

- **Probabilistic encryption.**
  - How to defeat the cryptanalyst’s chosen plain text attack on a public key cryptosystem.

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Date: Thursday, December 15, 2005, 8:00 pm (Refreshments at 7:30 pm)
Place: Sarnoff Corp., Routes 1 and 571, Princeton, NJ
Information: Rebecca Mercuri (609) 895-1375, Dennis Mancl (908) 582-7086
On-line info: [http://www.acm.org/chapters/princetonacm](http://www.acm.org/chapters/princetonacm)

All ACM / IEEE-CS meetings are open to the public. Students and their parents are welcome. There is no admission charge, and refreshments are served.

A pre-meeting dinner with the speaker is held at 6:00 p.m. at Ruby Tuesday’s Restaurant on US 1. Please send email to Princetonacm@acm.org in advance if you plan to attend the dinner.