

1056-00-1867

**Solomon W Golomb\*** (sgolomb@usc.edu), University of Southern California, 3740 McClintock Ave., EEB 504A, Los Angeles, CA 90089-2565. *Algebraic Constructions for Communication Sequences.*

Sequences are used to modulate signals in many applications involving digital communications, radar, sonar, synchronization and cryptography. The constructions of such sequences generally involve algebraic methods. Thus, the theory of maximum period linear shift register sequences as used in CDMA 3G cell phone systems is based on the properties of polynomials over finite fields. All the known systematic constructions for Costas arrays, used to generate frequency hopping patterns for radar and sonar that have ideal "thumb-tack" ambiguity functions, are based on properties of primitive elements in finite fields. This talk summarizes much of what has already been done, and delineates research areas with interesting unsolved algebraic problems whose solutions would have useful applications. (Received September 22, 2009)