998-94-22 **Jon-Lark Kim*** (`jlkim@math.unl.edu`), Department of Mathematics, 810 Oldfather Hall, P.O. Box 880323, University of Nebraska - Lincoln, Lincoln, NE 68588-0323. *LDPC Codes and Their Constructions.*

Roughly speaking, a low-density parity-check (LDPC) code is a binary linear code with a sparse parity check matrix, i.e., a few ones in its parity check matrix. The first construction of LDPC codes is random, due to Gallager (1963). After forgotten for about 20 years, LDPC codes were revisited by Tanner who introduced a graphic representation of LDPC codes, called the Tanner graphs. MacKay and Neal (1996) demonstrated that LDPC codes approach the Shannon limit under the iterative decoding known as the sum-product algorithm. Hence LDPC codes have become interesting both practically and mathematically. It is highly desirable to construct LDPC codes combinatorially/algebraically for a better analysis of LDPC codes. In this talk we give an introduction to LDPC codes, and describe how to construct regular LDPC codes from bipartite graphs and from the incidence matrices of partial linear spaces. (Received December 24, 2003)