1026-52-30 **Bo'az B Klartag*** (bklartag@princeton.edu), Department of Mathematics, Washington Road, Princeton University, Princeton, NJ 08544. *A central limit theorem for convex sets.*

Suppose X is a random vector, that is distributed uniformly in some n-dimensional convex set. It was conjectured that when the dimension n is very large, there exists a non-zero vector u, such that the distribution of the real random variable <X,u> is close to the gaussian distribution. A well-understood situation, is when X is distributed uniformly over the n-dimensional cube. In this case, <X,u> is approximately gaussian for, say, the vector u = (1,...,1) / sqrt(n), as follows from the classical central limit theorem.

We prove the conjecture for a general convex set. Moreover, when the expectation of X is zero, and the covariance of X is the identity matrix, we show that for 'most' unit vectors u, the random variable <X,u> is distributed approximately according to the gaussian law. We argue that convexity - and perhaps geometry in general - may replace the role of independence in certain aspects of the phenomenon represented by the central limit theorem. (Received January 18, 2007)