Minimizing the discrepancy of a set system is a fundamental problem in combinatorics. One of the cornerstones in this area is the celebrated six standard deviations result of Spencer (AMS 1985): In any system of $n$ sets in a universe of size $n$, there always exists a coloring which achieves discrepancy $6\sqrt{n}$. The original proof of Spencer was existential in nature, and did not give an efficient algorithm to find such a coloring. Recently, a breakthrough work of Bansal (FOCS 2010) gave an efficient algorithm which finds such a coloring. His algorithm was based on an SDP relaxation of the discrepancy problem and a clever rounding procedure. In this work we give a new randomized algorithm to find a coloring as in Spencer’s result based on a restricted random walk we call Edge-Walk. Our algorithm and its analysis use only basic linear algebra and is “truly” constructive in that it does not appeal to the existential arguments, giving a new proof of Spencer’s theorem and the partial coloring lemma. Joint work with Raghu Meka