1011-60-381 **Ryan W. O'Donnell*** (odonnell@ias.edu), 1 Microsoft Way, Seattle, WA 98052. *Stability and chaos in elections (with applications in mathematics and computer science).*

Suppose we have a two-party election in which n voters vote independently and uniformly at random. An "election scheme" is a boolean function $f : \{0,1\}^n \to \{0,1\}$ that maps the voters' votes to the winning party. For example, f might be "Majority", or an "electoral college" scheme, or even a "dictator" scheme $f(x_1, \ldots, x_n) = x_i$.

Now consider the resilience of various elections schemes to noise — i.e., if each voter's vote is misrecorded with probability ϵ (perhaps due to a faulty voting machine), what is the probability this changes the rightful winner of the election?

In joint work with Elchanan Mossel (Berkeley) and Krzysztof Oleszkiewicz (Warsaw), I showed that among "fair" schemes, Majority is least sensitive to noise. I will discuss this result and some of its applications in theoretical computer science and mathematics. (Received August 30, 2005)