

MANY CHEERFUL FACTS

presents

Shuffling Cards for Fun and Profit

a talk by Aaron Kleinman

2:10 – 3:00pm on Tuesday, March 9, in room 939 Evans.

It is well known that it takes seven shuffles to mix up a deck of cards. In fact, the randomness of a deck exhibits a cut-off phenomenon: a pack of n cards remains very poorly mixed for about $\frac{3}{2} \log_2 n$ shuffles, but then suddenly becomes extremely well mixed. In this talk I'll explain exactly what this means and how you might go about proving it, as well as how to use this information to rip off your friends. If time permits I will attempt to illustrate this analysis with a card trick, though it will probably fail spectacularly.

*I am the very model of a modern Major General,
I've information vegetable, animal, and mineral,
I know the kings of England, and I quote the fights historical
From Marathon to Waterloo, in order categorical;
I'm very well acquainted, too, with matters mathematical,
I understand equations, both the simple and quadratical,
About binomial theorem I'm teeming with a lot o' news,
With many cheerful facts about the square of the hypotenuse!*

— Gilbert & Sullivan, *P o P*

The website for Many Cheerful Facts is
<http://www.math.berkeley.edu/~mcf>