

# NATURAL SCIENCES AND MATHEMATICS COLLOQUIUM SERIES 2020-2021

presents a virtual talk:

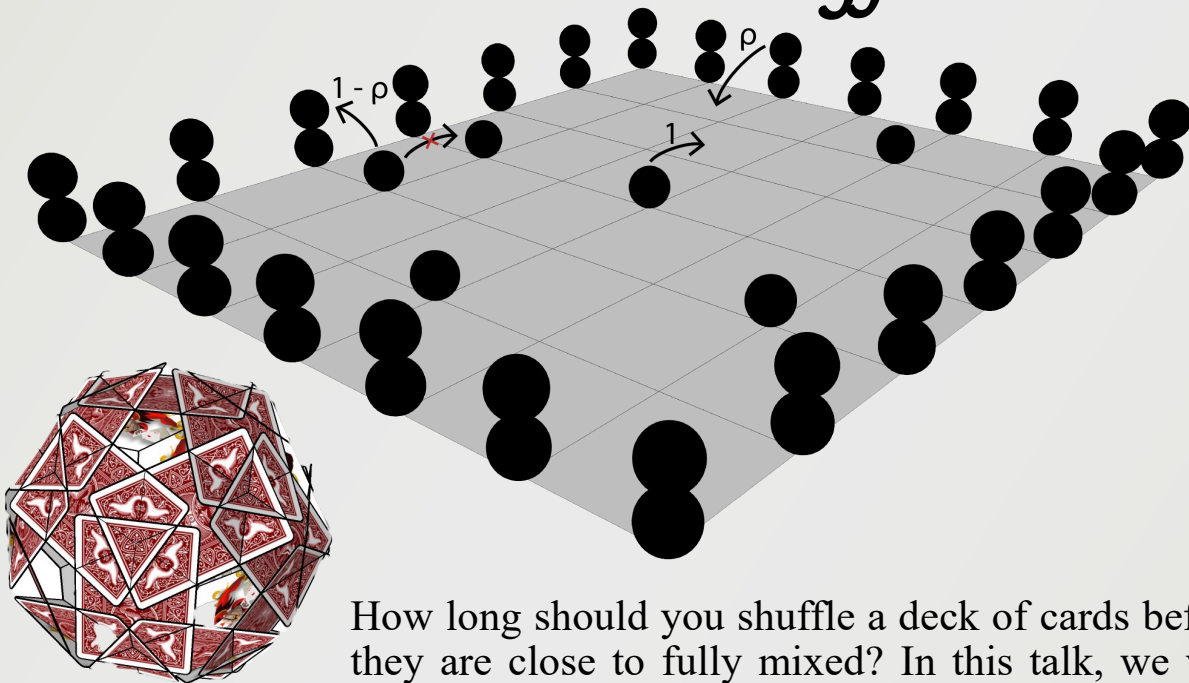
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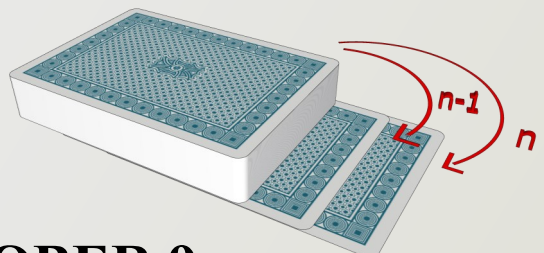
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## Mixing Times of Card Shuffling and Road Traffic



How long should you shuffle a deck of cards before they are close to fully mixed? In this talk, we will discuss some shuffling methods and their speeds of mixing, focusing especially on a phenomenon called "cutoff." We also mention a related road traffic problem and discuss its mixing properties. While cutoff has been mathematically proven for one-dimensional models of shuffling or road traffic, the higher-dimensional results have not---until 2020, by yours truly. And that elusive piece of the puzzle is Fourier analysis---the linear combination of sines and cosines, a.k.a. the harmonics which, when combined together, give each musical instrument its distinct timbre. Stay tuned, and you'll find out which "musical instrument" can be devised to create the perfect cutoff.



**FRIDAY, OCTOBER 9  
3:30 PM**

**NASC Colloquium link: <https://zoom.us/j/99595774508>**

**The webinar requires the password: nasc (all lowercase)**

The NASC colloquium link also requires you to have a registered Zoom account but does not require you to have a Colgate account. We are hoping these restrictions will make the talks as widely accessible as possible, while minimizing security risks.