

CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, October 9

3:00 – 4:00 PM

Maria Sanford, Room 101

ADVANCEMENTS IN *GRATE THEORY*

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Abstract: The “grate” problem considered here began with a simple question: "Given a binary string, how many bits must be flipped at random before one should expect to obtain a grate?", where a grate is a configuration in which no two zeroes are adjacent. The original problem suggests a natural asymptotic question, and in one dimension it can be shown that the expected number of flips, divided by the length of the string, tends to $1/2$. This observation leads naturally to higher-dimensional generalizations, replacing the string by increasingly large grid graphs and adjacency by graph independence.

In the specific setting considered here, we study an N -dimensional grid with one dimension tending to infinity while the others remain fixed. The proof proceeds by considering a random positive-density subset of vertices and showing, through first- and second-moment estimates, that the expected fraction of cells flipped must be greater than any number in $(0,1)$.

To join us online use the following link: <https://ccsu.webex.com/meet/gotchev>

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