

# On the singular probability of random Bernoulli matrices

*Date* Tuesday, April 10

*Time* 3:30 pm

*Location* 317 Mudd

*Abstract:* Let  $p_n$  be the probability that an  $n$  by  $n$  random matrix with  $+ - 1$  entries being singular. A famous conjecture in probabilistic combinatorics asserts that  $p_n = (1/2 + o(1))^n$ . The lower bound is trivial. However, even proving that  $p_n$  goes to 0 with  $n$  is a non-trivial task.

In this talk, we survey the developments concerning this conjecture, through the works of Komlos, Kahn-Komlos-Szemredi, Tao-Vu and Bourgain-Vu-Wood, leading to the most recent bound  $(1/2 + o(1))^{n/2}$ . The key new tool is inverse theorems motivated by results and proved by techniques from additive combinatorics.