

Department of Mathematics, BGU

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# Probability and ergodic theory (PET)

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*On Tuesday, June ,21 2016*

*At 10:50 – 12:00*

*In Math 101-*

Naomi Feldheim ) Stanford (

will talk about

## **Mean and Minimum**

Abstract: Let  $X$  and  $Y$  be two unbounded positive independent random variables. Write  $\text{Min}_m$  for the probability of the event  $\{\min(X,Y) < m\}$  and  $\text{Mean}_m$  for that of the event  $\{(X+Y)/2 < m\}$ . We show that the limit inferior of  $\text{Min}_m / \text{Mean}_m$  is always 0 (as  $m$  approaches infinity), regardless of the distributions of  $X$  and  $Y$ . We view this statement as a universal anti-concentration result, and discuss several implications. The proof is elementary but involved, relying on comparison to the “nearest” log-concave measure. We also provide a multiple-variables, weighted variant of this result in the i.i.d. case and pose a conjectured general result encompassing this phenomenon. Joint work with Ohad Feldheim