



## Mathematics and CS Seminar

# Turning a coin over instead of tossing it

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**Host: Laszlo Erdős**

Given a sequence of numbers  $p_n$  in  $[0,1]$ , consider the following experiment. First, we flip a fair coin and then, at step  $n$ , we turn the coin over to the other side with probability  $p_n$ ,  $n > 1$ , independently of the sequence of the previous terms. What can we say about the distribution of the empirical frequency of heads as  $n$  tends to infinity?

We show that a number of phase transitions take place as the turning gets slower (i.e.  $p_n$  is getting smaller), leading first to the breakdown of the Central Limit Theorem and then to that of the Law of Large Numbers. It turns out that the critical regime is  $p_n = (\text{const})/n$ . Among the scaling limits, we obtain Uniform, Gaussian, Semicircle and Arcsine laws.

This is joint work with Stas Volkov (Lund).

**Tuesday, August 8, 2017 04:00pm - 06:00pm**

IST Austria Campus Big Seminar room Ground floor / Office Bldg West (I21.EG.101)



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