



## Mathematics and CS Seminar

# Cutoff and discrete product structure in ASEP

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**Host: Lazlo Erdős**

We consider the asymmetric simple exclusion process (ASEP) on  $\mathbb{Z}$  with an initial data such that in the large time particle density  $\rho(\cdot)$  a discontinuity at the origin is created, where the value of  $\rho$  jumps from zero to one, but  $\rho(-\varepsilon), 1 - \rho(\varepsilon) > 0$  for any  $\varepsilon > 0$ . We consider the position of a particle  $x_M$  macroscopically located at the discontinuity, and show that its limit law has a cutoff under  $t^{1/2}$  scaling. Inside the discontinuity region, we show that a discrete product limit law arises, which bounds from above the limiting fluctuations of  $x_M$  in the general ASEP, and equals them in the totally ASEP. Sending  $M \rightarrow \infty$ , the discrete product limit law converges to  $F_{\text{GUE}} \times F_{\text{GUE}}$ , which was previously observed at shocks in TASEP.

**Thursday, February 7, 2019 04:15pm - 06:15pm**

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



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