1161-60-203 **Vishesh Jain*** (visheshj@stanford.edu), **Ashwin Sah** and **Mehtaab Sawhney**. *Perfectly sampling $k \geq (8/3 + o(1))\Delta$-colorings in graphs.*

Efficiently sampling a uniformly random (proper) k-coloring of a graph G with maximum degree Δ is an intensely studied algorithmic problem. Traditionally, the interest has been in obtaining *approximately uniform* samples, and the goal is to do this efficiently for k as close to Δ as possible.

In this talk, we will discuss the problem of efficiently obtaining *perfectly uniform* samples. This was first studied in 1998 by Huber, who provided an efficient perfect sampling algorithm provided that $k > \Delta(\Delta + 2)$. Recently, interest in this problem has been revived due to works on partial rejection sampling and deterministic approximate counting, and especially the very recent work of Bhandari and Chakraborty, who provided a perfect sampler for $k > 3\Delta$.

We will present a perfect sampler which breaks this barrier at $k = 3\Delta$, and works efficiently for all $k \geq (8/3 + o_\Delta(1))\Delta$.

Joint work with Ashwin Sah (MIT) and Mehtaab Sawhney (MIT). (Received August 17, 2020)