Anton Bernshteyn* (bahtoh@gatech.edu) and Clinton T. Conley (clintonc@andrew.cmu.edu). Equitable colourings of infinite graphs.

A proper $k$-coloring of a finite graph $G$ is called equitable if every two color classes differ in size at most by one. In particular, if $G$ has $n$ vertices and $k$ divides $n$, then in an equitable $k$-coloring of $G$ every color class has size exactly $n/k$. There is a natural way to extend this definition to infinite graphs on probability spaces. Namely, if $G$ is a graph whose vertex set $V(G)$ is a probability space, then a proper $k$-coloring of $G$ is equitable when every color class has measure $1/k$. In this talk I will discuss extensions of some classical results about equitable colourings to this setting, including an infinite version of the Hajnal–Szemerédi theorem on equitable $k$-colorings for $k \geq \Delta(G) + 1$. This is joint work with Clinton T. Conley. (Received August 17, 2020)