VCU Discrete Mathematics Seminar

Erdős covering systems

Prof Rob Morris (IMPA, Brazil)

Wednesday, Apr. 14
1:00-1:50

Zoom! @ `https://vcu.zoom.us/j/92975799914`
`password=graphs2357`

A covering system of the integers is a finite collection of arithmetic progressions whose union is the integers. The study of these objects was initiated by Erdős in 1950, and over the following decades he asked a number of beautiful questions about them. Most famously, his so-called "minimum modulus problem" was resolved in 2015 by Hough, who proved that in every covering system with distinct moduli, the minimum modulus is at most 10^{16}.

In this talk I will present a variant of Hough's method, which turns out to be both simpler and more powerful. In particular, I will sketch a short proof of Hough's theorem, and discuss several further applications. I will also discuss a related result, proved using a different method, about the number of minimal covering systems.

Joint work with Paul Balister, Béla Bollobás, Julian Sahasrabudhe and Marius Tiba.

For the DM seminar schedule, see:

`https://www.people.vcu.edu/~nobushaw/dms.html`