

VCU Discrete Mathematics Seminar

Rational Exponents for Generalized Turán Numbers

Prof Sean English
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Wednesday, Mar. 20
1:00-1:50 EDT

In person! in 4145 Harris Hall, and Zoom @
<https://vcu.zoom.us/j/92975799914>
password=graphs2357



The extremal number of the graph F , denoted $\text{ex}(n, F)$, is the maximum number of edges in an F -free graph on n vertices. The inverse rational exponent conjecture (perhaps first posed by Erdős and Simonovits in '81) postulates that for each rational number $r \in [1, 2]$, there exists some graph F such that

$$\text{ex}(n, F) = \Theta(n^r).$$

Recently, Bukh and Conlon proved a slightly weaker version of this conjecture - if one allows for finite families of forbidden graphs, then such a family does exist for each rational r .

We will show that a generalization of this conjecture also holds. Given two graphs F and H , the generalized extremal number $\text{ex}(n, H, F)$ is the maximum number of copies of H in an F -free graph on n vertices (note that $\text{ex}(n, F) = \text{ex}(n, K_2, F)$). We will explore which rational exponents are realizable for some different graphs H .

This is joint work with Anastasia Halfpap and Bob Krueger.

For the DM seminar schedule, see:

<https://go.vcu.edu/discrete>