

VCU Discrete Mathematics Seminar

Independence Theory of Graphs as a Metaphor

Prof Marco Aldi
(VCU!)

Wednesday, Nov. 6
1:00-1:50 EDT

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



The Dani-Mainkar construction assigns to each graph a 2-step nilpotent Lie algebra. Since two graphs are isomorphic if and only if the corresponding 2-step nilpotent Lie algebras are, one obtains a sort of dictionary between these two seemingly unrelated corners of mathematics. In this talk we describe a purely Lie-theoretic interpretation of independent sets of graphs that is compatible with the Dani-Mainkar construction. In particular, using graph theoretic-ideas as guiding principle, we are able to establish upper and lower bounds for the independence number of an arbitrary (not necessarily of Dani-Mainkar type) 2-step nilpotent Lie algebra. This is joint work with Daniele Grandini and the students from the 2024 NSF REU hosted by VCU.

For the DM seminar schedule, see:

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