

# VCU Discrete Mathematics Seminar

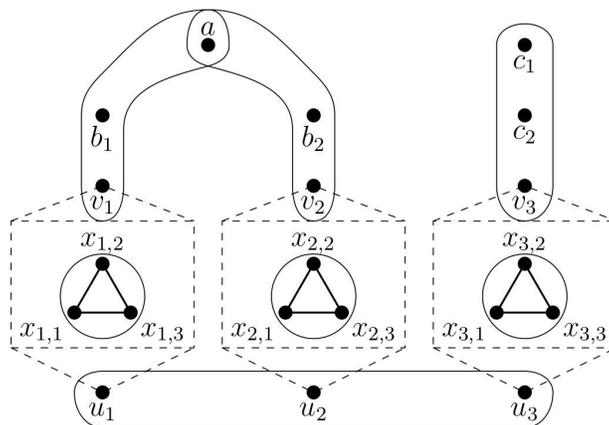
## *The Saturation Spectrum of Berge Stars*

**Prof Neal Bushaw**  
**(VCU!)**

Wednesday, Mar. 18  
1:00-1:50 EST

**In Person** in 4145 Harris, with Zoom option:

<https://vcu.zoom.us/j/81475528886>  
password=graphs2357



Given a graph  $G$  and a hypergraph  $\mathcal{H}$ , we say that  $\mathcal{H}$  is a **Berge- $G$**  when there is a bijection from  $V(G)$  to  $V(\mathcal{H})$  which maps edges into edges. We say that  $\mathcal{H}$  is **Berge- $G$  saturated** when  $\mathcal{H}$  contains no Berge- $G$ , but a Berge- $G$  subgraph always appears in  $\mathcal{H} + e$  for any  $e \in \overline{\mathcal{H}}$ .

How many edges are possible in Berge- $G$  saturated graphs? This set of possible edge counts is the **saturation spectrum for Berge- $G$** ; we determine the saturation spectrum completely when  $G = K_{1,5}$  and when the number of vertices in  $\mathcal{H}$  is divisible by 5, and determine all but a constant number of values in the spectrum of  $K_{1,\ell}$  when  $\ell \geq 5$ .

Most problems remain open, and we'll discuss a proper subset of them. This is joint work with Sean English (UNC-Wilmington), Emily Heath (Pomona), Daniel Johnston (Trinity College), and Puck Rombach (Vermont).

For the DM seminar schedule, see:

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