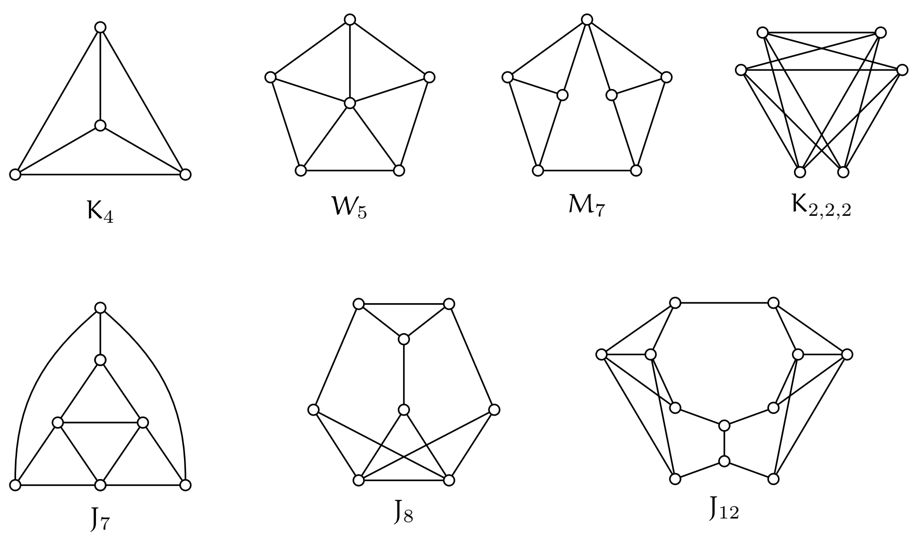
VCU Discrete Mathematics Seminar

Using the Potential Method to Color Near-Bipartite Graphs

Prof Dan Cranston
VCU!

Wednesday, Sept. 11
1:00-1:50
4145 Harris Hall



A graph G is *near-bipartite* if we can partition $V(G)$ as (I, F) where I is an independent set and F induces a forest. Similar to the problem of 3-coloring, deciding whether a graph is near-bipartite is NP-hard. Thus, we seek sufficient conditions. We show that a multigraph G is near-bipartite if $3|W| - 2|E(G[W])| \geqslant -1$ for every $W \subseteq V(G)$, and G contains no K_4 and no Moser spindle. We show that a simple graph G is near-bipartite if $8|W| - 5|E(G[W])| \geqslant -4$ for every $W \subseteq V(G)$ and G contains no subgraph in some finite family (each member of which is not near-bipartite). Both results are proved using the potential method, a powerful technique for coloring sparse graphs. This is joint work with Matthew Yancey. (No prior background will be assumed.)

For the DM seminar schedule, see:

`http://www.people.vcu.edu/~dcranston/DM-seminar.html`