

# Amelia Mattern (Binghamton)

## Balanced Group-Weighted Graphs

### Abstract for the Combinatorics Seminar 2017 May 2

A signed graph is obtained from a graph by labeling each edge as positive or negative. A signed graph is balanced if every circle has an even number of negative edges. Analogously, a marked graph is obtained from a graph by labeling each vertex as positive or negative, and a marked graph is consistent if every circle has an even number of negative vertices. Balanced signed graphs were classified by Harary in 1954, and consistent marked graphs were classified by Hoede in 1992. One can view both signed graphs and marked graphs as special cases of group-weighted graphs: graphs in which every edge and vertex is labeled with an element from an abelian group. I present the historical background and a 2012 paper by Joglekar, Shah, and Diwan in which they generalize a number of concepts from both signed and marked graphs. Most notably, I will discuss a characterization of “balanced” group-weighted graphs and a generalization of “switching” which gives a second characterization.

This is Ms. Mattern's Admission-to-Candidacy examination. The examining committee consists of Laura Anderson, Michael Dobbins, and Thomas Zaslavsky (chairone).

All interested persons are welcome to attend.

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