

# Groups and their Representation Graphs

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Thursday, January 19, 2012

008 Kemeny Hall, 4:00 pm  
(Tea 3:30 pm 300 Kemeny Hall)

## Abstract

For a group  $G$  and a vector space  $V$ , on which  $G$  acts (a  $G$ -module), we will produce a graph, called the representation graph, and we will look at ways that the group gives information about the graph and ways that the graph gives information about the group. The graph encodes the matrix representations of  $G$  which come from tensor products of  $V$ , and walks on the graph enumerate multiplicities of irreducible modules. As an important application, we will use the graph to understand the structure of the algebra of operators which commute with the group on tensor space (the tensor power centralizer algebra).

We will illustrate these ideas with many examples, including the symmetric, alternating, cyclic, and dihedral groups. We will also examine  $SU(2)$  and its finite subgroups and see how the McKay correspondence shows up in this setting.