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**Robert G. Donnelly\*** ([rob.donnelly@murraystate.edu](mailto:rob.donnelly@murraystate.edu)), Department of Mathematics and Statistics, Murray State University, Murray, KY 42071. *Extremal posets arising from semisimple Lie algebra representations*. Preliminary report.

In this talk we exhibit examples of some posets we have found in our search for combinatorial models of finite-dimensional semisimple Lie algebra representations, and we discuss our progress in understanding these examples in terms of a general framework. Our interest is in two collections of finite, ranked, edge-colored posets: “labelling posets” and the subset of “supporting graphs”. A labelling poset generates in a natural way a Laurent polynomial – the Weyl character – that is an invariant of a given semisimple Lie algebra representation. A supporting graph is a labelling poset whose edges can support in a certain way the actions of semisimple Lie algebra generators on basis elements of a representing vector space. In many cases we obtain labelling posets and supporting graphs by imposing natural partial orders on collections of simple combinatorial objects such as integer partitions or tableaux; these are often distributive (or at least modular) lattices. For a given semisimple Lie algebra representation, we partially order the associated labelling posets (supporting graphs) by containment of their respective Hasse diagrams. We say why we think that those posets which are minimal with respect to this partial ordering are particularly interesting. (Received January 01, 2007)