MATHEMATICS COLLOQUIUM

Finding Non-Zero Infinitesimal Blocks of Category $\mathcal{O}_S$

Kenyon Platt
Department of Mathematics
University of Georgia

Abstract: Representation theory is concerned with realizing an algebraic structure such as a group or an algebra as a collection of linear transformations of a vector space. One of the basic goals is to classify all such representations for each group or algebra. We will consider aspects of this question for representations of simple Lie algebras over the field $\mathbb{C}$ of complex numbers. Furthermore, we will look at representations having certain finiteness properties, collected in a category called category $\mathcal{O}_S$, where S is a fixed subset of simple roots of the Lie algebra. Category $\mathcal{O}_S$ decomposes into the direct sum of special subcategories, called infinitesimal blocks. Because of the way they are defined, it is not at all obvious when a given infinitesimal block is nonzero. The question of whether an infinitesimal block is nonzero takes us into the realm of orbits of nilpotent matrices, where combinatorial and geometric tools will provide the answer.

Date: Monday, **February 11, 2008**
Time: 4:00 pm – 5:00 pm
Place: J. Wiener Lecture Hall, MAGC 1.302

Refreshments will be served at 3:50pm.

For further information or for special accommodations, contact Dr. Karen Yagdjian at 381-2145, via email at yagdjian@utpa.edu, or visit www.math.panam.edu/colloquia.html