

MIT Lie Groups Seminar
Wednesday 4:30–5:30, room 2-142

May 8: Lewis Topley (University of Kent), *Minimal modules for general linear Lie algebras in characteristic p*

Let \mathfrak{g} denote the Lie algebra of a reductive group defined over a field of positive characteristic p , not too small. It has been known for over twenty years that the dimensions of simple \mathfrak{g} -modules are bounded below by p to the power of half the dimension of the coadjoint orbit of the Frobenius character. Both Humphreys and Kac conjectured that every Frobenius character should admit a simple module of this dimension, and such modules are known as minimal (or holonomic). The existence of minimal modules has finally been proven in large characteristics, thanks to the work of Losev and Premet on the representation theory of finite W -algebras, although in type A the existence had already been observed by Friedlander-Parshall.

In this talk I will describe a joint work with Simon Goodwin (Birmingham) in which we classify the minimal modules for \mathfrak{gl}_n using the theory of modular finite W -algebras and shifted Yangians in characteristic p . As a consequence we see that they are all parabolically induced. I will also explain how this theorem may be viewed as a modular analogue of a famous theorem of Moeclin, classifying the completely prime primitive ideals of $U(\mathfrak{gl}_n(\mathbb{C}))$.