March 29: Ivan Losev (MIT), “Quantization of nilpotent orbits vs. W-algebras.”

Let $G$ be a semisimple algebraic group over $\mathbb{C}$, $\mathfrak{g}$ its Lie algebra, and $O$ a nilpotent orbit in $\mathfrak{g}$. The goal of this talk is to relate quantizations of $O$ (and of its $G$-equivariant coverings) to one-dimensional modules over the $W$-algebra constructed from $O$. By a quantization we mean a deformation quantization in the algebro-geometric setting equipped with some additional structures. The structures of interest are a $G$-action, a $\mathbb{C}^\times$-action and a quantum comoment map. The relationship is that, roughly, quantizations are in a natural (tautological in some sense) one-to-one correspondence with one-dimensional modules over the $W$-algebra.

To the speaker’s huge disappointment this result is not new, it was proved by Mœglin in the late 80s in a different but essentially equivalent form.

No prior knowledge of $W$-algebras is required.