Abstract

Let G be a simple algebraic group and let $G^\vee$ be its Langlands dual group. Barbasch and Vogan based on earlier work of Lusztig and Spaltenstein, define a duality map D that sends nilpotent orbits $\mathbb{O}_{e^\vee} \subset \mathfrak{g}^\vee$ to special nilpotent orbits $\mathbb{O}_e \subset \mathfrak{g}$. In a work by Losev, Mason-Brown and Matvieievskyi, an upgraded version $\tilde{D}$ of this duality is considered, called the refined BVLS duality. $\tilde{D}(\mathbb{O}_{e^\vee})$ is a G-equivariant cover $\tilde{\mathbb{O}}_e$ of $\mathbb{O}_e$. Let $S_{e^\vee}$ be the nilpotent Slodowy slice of the orbit $\mathbb{O}_{e^\vee}$. The two varieties $X^\vee = S_{e^\vee}$ and $X = \text{Spec}(\mathbb{C}[\tilde{\mathbb{O}}_e])$ are expected to be symplectic dual to each other. In this context, a version of the Hikita conjecture predicts an isomorphism between the cohomology ring of the Springer fiber $\mathcal{B}_{e^\vee}$ and the ring of regular functions on the scheme-theoretic fixed point X^T for some torus T. This conjecture holds when G is of type A. In this talk, I will discuss the statuses of similar statements about the Hikita conjecture for general G. Part of the result is based on a joint work with Vasily Krylov and Dmytro Matvieievskyi.