

**Speaker:**     **Seunghun Hong**  
                  **Pennsylvania State University**

Tuesday, November 29, 2011  
12:30 pm  
125 Hayes-Healy Hall

**Title:** A Lie-algebraic approach to the local index theorem on a flag variety

**Abstract:**

Let  $G$  be a compact Lie group. Let  $T$  be a maximal torus in  $G$  (more generally we could consider any connected closed subgroup). Using a  $K$ -theory point of view, Bott related the Atiyah–Singer index theorem for elliptic operators on  $G/T$  to the Weyl character formula. In this talk we shall explain how to prove the local index theorem on  $G/T$  using Lie algebra methods. Our method follows in outline the proof of the local index theorem due to Berline and Vergne. But our use of Kostant’s cubic Dirac operator in place of the riemannian Dirac operator leads to substantial simplifications. An important role is also played by the quantum Weil algebra of Alekseev and Meinrenken.