

Title: Virtual Coulomb branch and quantum K-theory

Abstract: In this talk, I will discuss a virtual variant of the quantized Coulomb branch constructed by Braverman-Finkelberg-Nakajima, where the convolution product is modified by a virtual intersection. The resulting virtual Coulomb branch acts on the moduli space of quasimaps into the holomorphic symplectic quotient  $T^*N//G$ . When  $G$  is abelian, over the torus fixed points, this representation is a Verma module. The vertex function, a K-theoretic enumerative invariant introduced by A. Okounkov, can be expressed as a Whittaker function of the algebra. The construction also provides a description of the quantum  $q$ -difference module. As an application, this gives a proof of the invariance of the quantum  $q$ -difference module under the variation of GIT.