

1123-14-290

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([jhilburn@math.upenn.edu](mailto:jhilburn@math.upenn.edu)) and **Hee-Cheol Kim**. *Monopoles, Vortices, and Vermas*.

Symplectic duality, as described by Braden-Proudfoot-Licata-Webster, is an equivalence of certain categories associated to a pair of conical symplectic singularities. Each such category is a subcategory of modules over a deformation quantization of functions on the corresponding singularity. The prototypical example is when the singularity is the nilpotent cone of a semi-simple Lie algebra  $\mathfrak{g}$  in which case the corresponding category is the Bernstein-Gelfand-Gelfand Category  $\mathcal{O}$  associated to  $\mathfrak{g}$ .

It is expected that all such dual pairs arise as Higgs and Coulomb branches of 3d  $\mathcal{N} = 4$  SUSY field theories. By examining a certain twist of this theory one can realize the action of a deformation quantization of the Coulomb branch on a Verma module in terms of the action of monopole operators on the vortex moduli space. One can then use this to write the partition functions for 2d  $\mathcal{N} = (2, 2)$  theories in terms of Whittaker vectors. This gives a physical formulation and generalization of the finite AGT conjecture which has been studied by Braverman, Finkelberg, Feigin, Frenkel, Kuznetsov, Nakajima, and Rybnikov in the case of a nilpotent orbit closure. (Received August 29, 2016)