Geometry, Physics, and Representation Theory

Northeastern University

Tudor Dimofte

Perimeter Institute.

Monday, Nov 16, 3-4 pm, Nightingale 544 (note unusual day, time, and location!)

Symplectic duality and 3d gauge theory

Abstract. Symplectic duality (as presented in work of Braden, Licata, Proudfoot, and Webster) describes a relationship between many structures associated to pairs of complex symplectic manifolds (M,M!). The relationship includes a derived equivalence of categories of modules (O,O!) over quantizations of (M,M!), which generalizes the classic Koszul duality of Beilinson-Ginzburg-Soergel in geometric representation theory.

It has been observed that every known symplectic dual pair (M,M!) actually comprises two branches in the moduli space of vacua of the same 3d supersymmetric gauge theory. I will discuss how modules for quantizations come from studying boundary conditions in these gauge theories, how symplectic duality arises in physics, and what new things can be learned from the physical constructions. (Joint work with M. Bullimore, D. Gaiotto, and J. Hilburn.)