

Stable Envelopes, Bow Varieties, 3d Mirror Symmetry

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There are many bridges connecting geometry with representation theory. A key notion in one of these connections, defined by Maulik-Okounkov, Okounkov, Aganagic-Okounkov, is the “stable envelope (class)”. The stable envelope fits into the story of characteristic classes of singularities as a 1-parameter deformation (\hbar) of the fundamental class of singularities. Special cases of the latter include Schubert classes on homogeneous spaces and Thom polynomials in singularity theory. While stable envelopes are traditionally defined for quiver varieties, we will present a larger pool of spaces called Cherkis bow varieties, and explore their geometry and combinatorics. There is a natural pairing among bow varieties called 3d mirror symmetry. One consequence is a ‘coincidence’ between elliptic stable envelopes on 3d mirror dual bow varieties (a work in progress). We will also discuss the Legendre-transform extension of bow varieties (joint work with L. Rozansky), the geometric counterpart of passing from Yangian R-matrices of Lie algebras $\mathfrak{gl}(n)$ to Lie superalgebras $\mathfrak{gl}(n|m)$.

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