

Perverse Sheaves and Resurgence

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The Borel summation procedure, common in resurgence theory, translates irregular behavior governed by asymptotic series and Stokes phenomena, in terms of multivalued functions in the Borel plane, which can be studied via perverse sheaves and their generalizations. The talk proposes a framework for resurgence based on perverse sheaves which are algebras with respect to additive convolution. The singularity structure of a perverse sheaf on \mathbb{C} is given by its spaces of vanishing cycles and transport maps between them along various paths. The concept of alien derivatives adapts naturally to this context. An algebra with respect to convolution gives, after Fourier transform, an algebra with respect to tensor product, so its Stokes matrices are algebra automorphisms, i.e., in case of a commutative algebra, coordinate changes. Joint work in progress with Y. Soibelman.

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