FROM ENUMERATIVE GEOMETRY TO DERIVED GEOMETRY

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ABSTRACT. In his paper "Enumeration of rational curves via torus actions", M. Kontsevich reshaped enumerative geometry introducing the notion of stable map. This allowed him to solve the classical problem of counting how many smooth rational curves of degree d pass through $3d - 1$ points in general position in $\mathbb{P}^2_{\mathbb{C}}$. The renewed interest for this problem at that time came from attempts to understand mirror symmetry in mathematical terms. Indeed, in dealing with mirror symmetry, people were lead to consider similar enumerative problems but in more general environments than $\mathbb{P}^2_{\mathbb{C}}$. The basic issue is that the space of parameters of stable maps to a general smooth proper scheme X is not smooth nor equidimensional in general. We will see how derived algebraic geometry can help in fixing this problem. If time permits, I will describe recent advances in the analytic setting.

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