Enumeration of curves on K3 surfaces by polyhedral degenerations

Let (S, L) be a primitively polarized K3 surface, k an integer. Integral curves of geometric genus g in the linear system |kL| form a family of dimension g (if non-empty). One wants to count the number of such curves passing through g general points fixed on S. Gromov-Witten theory provides a complete answer to this question when k = 1, but poses serious problems whenk > 1. I shall present an approach based upon degenerating the surface S immersed by the system |kL| in a union of planes incarnating a triangulation of the S^2 sphere. This is a joint project with Ciro Ciliberto.

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