



Universitat de Barcelona
Departament d'Àlgebra i Geometria

SEMINARI DE GEOMETRIA ALGEBRAICA 2004-05

Divendres, dia 25 de Febrer
Aula B1. Facultat de Matemàtiques

15:00 *Quantum cohomology and characteristic
numbers*

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Resum. The text-book example of quantum cohomology applied to enumerative geometry is the celebrated formula of Kontsevich (1994) which solves the classical counting problem: “How many rational plane curves of degree d pass through $3d - 1$ general points?” The formula is a recursion whose only initial input is the fact that there is a unique straight line through two points, and the recursion itself is the expression of the associativity of the quantum product (the WDVV equation), a new ring structure on the cohomology space. I’ll spend a considerable time explaining this now-classical material, because the main result I want to present is a direct generalisation. Namely, the WDVV equation can be generalised (a certain deformation constructed by coupling with 2D gravity) to account also for tangency conditions, solving the century-old characteristic number problem for rational plane curves, i.e. the numbers of degree- d rational curves through a points and tangent to b lines, $a + b = 3d - 1$. In the last two minutes of the talk, I will discuss other enumerative problems, and generalisation to higher genus and arbitrary target spaces...