INTRODUCTION TO GROMOV-WITTEN INVARIANTS

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The goal of this crash course is to introduce the basic notions of moduli space of stable maps and Gromov-Witten invariants. In particular when the stable maps have rational domain and the target is a projective space.

Course meeting times

We meet in the following days of June 2022:

Wednesday, 15/6, at **13:30**-15
Friday, 17/6, at 11:30 -13
Monday, 20/6, at 11:30 -13
Wednesday, 22/6, at 11:30 -13
Friday, 24/6, at 11:30 -13

The classroom will be 6.2.33 (sala de seminários).

Prerequisite

Basic algebraic geometry: schemes, singular cohomology, and cohomology of sheaves. A good knowledge of [Har77] is useful.

Description

The course is split in 5 main parts. We will cover the following topics, time permitting.

(1) Basic definitions.
(2) The case of genus 0: boundary divisors and examples.
(3) Gromov-Witten invariants.
(4) Quantum cohomology.
(5) Kontsevich-Atiyah-Bott formula.

If time permits, we will give some enumerative applications. The main references are [FP97], [CK99] and [HTK$^+$03].

References

[CK99] David A. Cox and Sheldon Katz, *Mirror symmetry and algebraic geometry*, Mathematical Surveys and Monographs, vol. 68, American Mathematical Society, Providence, RI, 1999. MR 1677117

[FP97] W. Fulton and R. Pandharipande, *Notes on stable maps and quantum cohomology*, Algebraic geometry—Santa Cruz 1995, Proc. Sympos. Pure Math., vol. 62, Amer. Math. Soc., Providence, RI, 1997, pp. 45–96. MR 1492534

[Har77] Robin Hartshorne, *Algebraic Geometry*, Springer-Verlag, New York-Heidelberg, 1977, Graduate Texts in Mathematics, No. 52. MR 0463157

[HTK$^+$03] Kentaro Hori, Richard Thomas, Sheldon Katz, Cumrun Vafa, Rahul Pandharipande, Albrecht Klemm, Ravi Vakil, and Eric Zaslow, *Mirror symmetry*, vol. 1, American Mathematical Soc., 2003.

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