

COLÓQUIO DE MATEMÁTICA

Quarta-feira, 22 de novembro de 2023 às 16h00

**Enumerative geometry, quantum differential equations,
and derived categories**

Giordano Cotti

(FCUL - DM)

FACULDADE DE CIÊNCIAS
Edifício C6 - Sala: 6.2.33



Ciências | Matemática
ULisboa

*Convívio antes do Colóquio na sala dos docentes do C6,
com café, chá e bolos (15h45 até às 16h00)*

Abstract:
Enumerative geometry sinks its roots many centuries back in time. In the last decades, ideas coming from physics brought innovation to this research area, with both new techniques and the emergence of new rich geometrical structures. As an example, Gromov--Witten theory, focusing on symplectic invariants defined as counting numbers of curves on a target space, led to the notion of quantum cohomology and quantum differential equations (qDEs).
The qDEs define a class of ordinary differential equations in the complex domain, whose study represents a challenging active area in both contemporary geometry and mathematical physics. The qDEs define rich invariants attached to smooth projective varieties. These equations, indeed, encapsulate information not only about the enumerative geometry of varieties but even (conjecturally) of their topology and complex geometry. The way to disclose such a huge amount of data is through the study of the asymptotics and monodromy of their solutions. This talk will be a gentle introduction to the study of qDE's, their relationship with derived categories of coherent sheaves (in both non-equivariant and equivariant settings), and a theory of integral representations for its solutions. Overall, the talk will be a survey of the results of the speaker in this research area.