Seminários Genet-Roussel
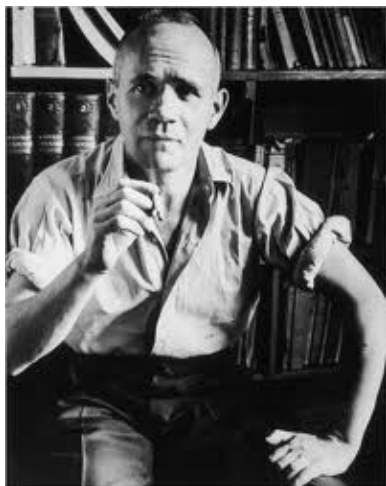

Palestrante: **Pietro Tortella** (ICMC)

Data: **17 de agosto** (sexta-feira)

Local: Auditório novo (6-001)

Horário: 14:00

Introduction to non abelian Hodge theory

We will give an introductory talk on Simpson's works on non abelian Hodge theory, and, if time allows, some further research directions.

Broadly speaking, non abelian Hodge theory aims to understand the fundamental group of a compact Kähler manifold (or smooth projective variety) via its representations in non abelian groups. We will stick with the $\mathrm{GL}(r, \mathbb{C})$ case. It is well known that representations of the fundamental group of X with values in $\mathrm{GL}(r, \mathbb{C})$ are the same thing as flat connections over bundles of rank r on X. Simpson's non abelian Hodge correspondence is a correspondence between (semistable) such objects and (semistable) Higgs bundles. The latter are pairs (E, ϕ) where E is a holomorphic vector bundle over X while ϕ is a holomorphic section of the bundle of one forms with values in $\mathrm{End}\, E$. We will then see how the construction of lambda-connections, that essentially is the twistor space of the hyperkahler structure of the moduli space of Higgs bundles, gives a way to define the Hodge filtration in the non abelian case, and to define a compactification of M_{DR}. If time allows, we will present a work in progress where we generalize these lambda connections when the underlying variety admits Nijenhuis structures, and try to expose some applications.