Deformazione-quantizzazione in ambito complesso

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Calendario: 10 hours, Torre Archimede:

November 17, 15:00-17:00 room 1BC/50
November 18, 15:00-17:00 room 1BC/50
November 23, 15:00-17:00 room 2BC/30
November 24, 15:00-17:00 room 2BC/30
November 25, 15:00-17:00 room 2BC/30

Prerequisiti: void

Tipologia di esame: oral exam

SSD: MAT/03/05/07

Programma del corso:

The deformation-quantization problem for a Poisson manifold asks for the existence of a (not necessarily commutative) formal deformation of the algebra of functions such that the first order of the commutator coincides with the Poisson bracket. Kontsevich proved in 1997 that the deformation-quantization problem is always solvable in a real C^∞ framework. He also later showed how sheaf theoretical techniques are necessary to deal with the algebraic or complex analytic framework. Recently, Gukov-Witten further motivated the interest of the complex domain and of D-module theory in this context.

This course presents an approach to deformation-quantization in the complex domain using the tools of algebraic analysis (stacks, D-modules, microdifferential operators, modules over DQ-algebras), with a particular emphasis on the symplectic case. Here is a list of subjects that will be discussed:

- D-modules and operations
- Microdifferential modules
- Deformation quantization algebra on complex cotangent bundles
- Deformation quantization algebroids on complex manifolds
- Holonomic modules on complex symplectic manifolds

As a reference we will use recent papers of Kashiwara and Schapira available on the ArXiv.

The interest of these construction from the point of view of mathematical physics shall be discussed in an additional series of lectures.