



ID de Contribution: 10

Type: Mini-cours

Hochschild (co)homology, deformation theory and Caldararu's conjecture

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It is well known that the Hochschild (co)homology of a smooth algebraic variety (or real/complex manifold) may be additively identified with its tangent (co)homology through the Hochschild-Kostant-Rosenberg isomorphism.

In 2003 Caldararu published an intriguing conjecture (which he attributes to Kontsevich) that in order to make the HKR morphism compatible with the multiplicative structures one has to twist it with the square root of the Todd class, yielding an unexpected connection with the Riemann-Roch theorem. Surprisingly this conjecture has so far resisted all attempts to prove it by elementary means.

Calderaru's conjecture was proved by Damien Calaque, Carlo Rossi and myself in 2009 (see arXiv:0904.4890) using techniques from modern deformation theory. The aim of the course is to give an introduction to this theory and to explain the proof of the conjecture. A rough outline will be as follows.

- (1) Kontsevich and Tsygan formality results.
- (2) Globalization methods.
- (3) Application to the proof of Caldararu's conjecture.

If time permits then I will discuss some more applications to deformation theory.

Mots Clés / Keywords

Hochschild (co)homology; deformation theory; formality results

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