Kontsevich Quantization and Duflo Isomorphism

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One of the important questions in harmonic analysis concerns the solvability of bi-invariant differential operators on a given Lie group G. The fundamental idea, developed already by Chevalley and Harish-Chandra, is to reduce this problem to the solvability of differential operators on the corresponding Lie algebra $\mathfrak{g}$.

During last decades different methods were investigated for particular classes of Lie groups : nilpotent, semi-simple, reductive etc... and the positive answer to the solvability problem was given by M. Duflo in the case of an arbitrary real finite-dimensional Lie group in 1979.

On the other hand, in 1997 M. Kontsevich showed the so-called formality theorem implying that on every smooth Poisson manifold there exists an associative $\star$-product. Once applied to the particular case of the dual of a finite-dimensional Lie algebra $\mathfrak{g}^*$ this theorem brings a new light on the problem of solvability of bi-invariant differential operators and it shows the canonical character of the Duflo's construction.

In this talk we discuss the link between the Kontsevich Quantization and the Duflo isomorphism and explain the extension of the Duflo map to higher cohomologies.