

Announcement

Seminar on Deformation Quantization and Geometry

17. 5. 2024 at 14:00 s.t.

Seminarroom SE 31

MICHAEL HEINS (JMU WÜRZBURG)

Universal Complexifications of Lie groups

This talk gives an elementary introduction to Hochschild's notion of *universal complexification* with a focus on the resulting complex geometry. The particular setting of a vector space group provides both a motivating appetizer and ultimately reflects the infinitesimal situation of the general case. During the construction of the universal complexification, we shall meet the universal covering group, utilize Lie's seminal theorems and believe in the exactness of all good sequences. Afterwards, we develop some intuition and dispel some misconceptions by means of numerous examples, where we shall encounter some rather intriguing pathologies, all of which — how else would it be? — involve the group $SL_2(\mathbb{R})$. We then discuss abstract geometric features of universal complexifications and provide some sufficient criteria to avoid the aforementioned pathologies related to the fundamental groups. If time permits, we end with some directions for ongoing and future research involving complexification of more geometrical objects. There will be one (1) complete proof and its appreciation is compulsory for all participants.

Invited by Stefan Waldmann