Im Oberseminar

Deformationsquantisierung

spricht am **16.10.2015 um 14 Uhr c.t.,**

im Seminarraum 00.009 (Physik Ost)

MATTHIAS SCHÖTZ

über das Thema:

Duality of uniform spaces and bornological unital abelian partial *-algebras

By the Gel'fand-Naimark theorem, the category of abelian C^*-algebras is equivalent to the category of compact Hausdorff spaces via two functors Φ and $\mathcal{A}$ that assign to every abelian C^*-algebra A the topological space $\Phi(A)$ of its characters with the weak-*-topology and to every compact Hausdorff space X the C^*-algebra $\mathcal{A}(X)$ of continuous compex-valued functions over X. On the arrow-side, they simply map every continuous unital *-homomorphism / every continuous function to its pull-back.

This theorem lies at the heart of non-commutative geometry and strict deformation quantisation in the spirit of Rieffels work, where abelian C^*-algebras correspond to ordinary commutative geometry and classical observable algebras and non-abelian C^*-algebras to non-commutative geometry and quantum observable algebras. If one tries to generalise this to the realm of e.g. Fréchet-*-algebras, then one also has to generalise the Gel'fand-Naimark theorem:

It is immediately clear that the construction of the space of characters of a general unital abelian *-algebras and of the *-algebra of complex-valued continuous functions over a general topological space still make sense, but they do not establish an equivalence of these two categories. Nevertheless, one can ask what the largest sub-categories of unital abelian *-algebras and topological spaces are, such that this construction induces an equivalence of categories. This question was basically solved with the introduction of realcompact spaces by Edwin Hewitt.

I suggest that this duality can be generalised even more by transfering the construction to uniform spaces and the partial *-algebras of the uniformly continuous complex-valued functions over them. In this talk, I will give the definition of uniform spaces and (bornological) unital abelian partial *-algebras, discuss their basic properties and explain the duality between these two categories.

gez. Stefan Waldmann