Oberseminar
Analysis und Theoretische Physik

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Commutative algebras of Toeplitz operators on the unit ball

Let $\mathbb{B}^n$ be the unit ball in $\mathbb{C}^n$. Denote by $\mathcal{A}_\lambda^2(\mathbb{B}^n)$, $\lambda \in (-1, \infty)$, the standard weighted Bergman space, which is the closed subspace of $L_\lambda^2(\mathbb{B}^n)$ consisting of analytic functions. The Toeplitz operator T_a with symbol $a \in L_\infty(\mathbb{B}^n)$ and acting on $\mathcal{A}_\lambda^2(\mathbb{B}^n)$ is defined as the compression of a multiplication operator on $L_\lambda^2(\mathbb{B}^n)$ onto the Bergman space, i.e., $T_a f = B_\lambda(af)$, where B_λ is the Bergman (orthogonal) projection of $L_\lambda^2(\mathbb{B}^n)$ onto $\mathcal{A}_\lambda^2(\mathbb{B}^n)$.

Note that for a generic subclass $S \subset L_\infty(\mathbb{B}^n)$ of symbols the algebra $\mathcal{T}(S)$ generated by Toeplitz operators T_a with $a \in S$ is non-commutative and practically nothing can be said on its structure. However, if $S \subset L_\infty(\mathbb{B}^n)$ has a more specific structure (e.g. induced by the geometry of $\mathbb{B}^n$, invariance under a certain group action, or with a specific smoothness properties) the study of operator algebras $\mathcal{T}(S)$ is quite important and has attracted lots of interest during the last decades.

It was observed recently that there exist many non-trivial algebras $\mathcal{T}(S)$ (both C^* and Banach) that are commutative on each standard weighted Bergman space. We present the description, classification, and the structural analysis of these commutative algebras. For the case of commutative C^*-algebras this permits us to characterize the majority of the essential properties of the corresponding Toeplitz operators, such as compactness, boundedness, spectral properties, invariant subspaces, etc.

Dienstag, 5.5.2015, 16:00h, Raum g005
Hauptgebäude der Leibniz Universität

Dazu laden herzlich ein:
Prof. Dr. Wolfram Bauer
Prof. Dr. Joachim Escher
Prof. Dr. Olaf Lechtenfeld
Prof. Dr. Elmar Schrohe
Prof. Dr. Christoph Walker