

SEMINAR
on
COMPLEX AND HYPERCOMPLEX ANALYSIS

Sala Sousa Pinto, Departamento de Matemática,

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**The Shale-Weil approach in complex analysis
and operator theory**

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In this talk the relevance of the Shale-Weil theorem (cf. [R. Howe, J. Funct. Anal. 1980]) on the construction of polyanalytic function spaces will be explored. Likewise we will expose its relevance on the study of class of operators obtained from Berezin-Klauder-Toeplitz quantization.

Starting from a group representation for the Heisenberg group \mathbb{H} , it will be shown the relevance of the symmetries of the metaplectic group $\widetilde{Sp}(2)$ (the so-called Shale-Weil representation) and moreover the relevance of the symmetries of $\mathbb{H} \rtimes \widetilde{Sp}(2)$ in the construction of polyanalytic Fock spaces $\mathbf{F}^n(\mathbb{C})$ of order n on the complex plane \mathbb{C} likewise polyanalytic Bergmann spaces $\mathbf{A}_\alpha^n(\mathbb{D})$ of order n ($\alpha \geq 0$) on a Siegel disk \mathbb{D} . Afterwards, for each given group G with subgroup H , we will construct families of coherent states from the polyanalytic function space $\mathbf{F}^n(\mathbb{C})$ resp. $\mathbf{A}_\alpha^n(\mathbb{D})$ and from the projective group representation encoded by the bundle section $\sigma : G/H \rightarrow G$, whereby G/H denotes the homogeneous space.

Further implications of this approach in the study of Toeplitz operators to certain classes of symbols belonging to Gel'fand-Shilov or BMO spaces will be explored *a-posteriori*.