Speaker: Krzysztof Nowak, Drexel University

Title: Low dimensional phase space parametrizations of reproducing formulae and orthonormal bases in space dimensions 1 and 2.

Abstract: The talk consists of three parts. In the first part we address the issue of reproducing formulae and wavelet type bases in space dimension 2 with 2 dimensional phase space parametrizations. We discuss recent, still unpublished results, which are the outcome of a joint work with Margit Pap. In the second part we move to historical perspectives. We present the full classification of reproducing formulae coming out of restrictions of the extended (projective) metaplectic representation of $\mathbb{R}^2 \rtimes \text{SL}(2, \mathbb{R})$ to its connected Lie subgroups, obtained in collaboration with Filippo De Mari about two decades ago, and published in 2001. In the third part, we address the context of any finite space dimension $n$. We introduce the extended (projective) metaplectic representation defined on the semi-direct product $\mathbb{R}^{2n} \rtimes \text{Sp}(n, \mathbb{R})$, and we make comments on progress done recently in this broad framework for generating reproducing formulae.