First talk—Weyl-Heisenberg-Frames: Theory and Applications in Signal Analysis

Both in signal analysis and in data transmission series expansions of the form $f(t) = \sum_{k,l \in \mathbb{Z}} c_{kl} e^{2\pi iblt}g(t - ak)$, so-called Gabor expansions, are used. Usually the coefficients $c_{kl}$ are determined by means of a dual window $\gamma$. For most applications it is essential to construct pairs of windows $(g, \gamma)$ that are both well localized simultaneously in time and frequency. We will present new results on the problem of window design and discuss applications to signal compression and the design of pulse shapes in OFDM and BFDM systems.

Second talk—Pseudodifferential Operators and Modulation Spaces

Modulation space norms are natural measures to quantify the time-frequency concentration of functions. We present these spaces of functions and distributions as natural symbol classes for proving boundedness results and trace class results for pseudodifferential operators and give some extensions of the theorem of Calderón and Vaillancourt.