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Room: UB iA (Universitat de Barcelona)

From Time-Frequency Analysis to Operator Algebras, and back again

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I will discuss how well-known open problems in Gabor analysis can be translated into the language of operator algebras, and how state-of-the-art results in that field lead to new partial solutions to these original problems. Concretely, I will report on recent joint work with U. Enstad and H. Thiel, where we provide an explicit criterion for a lattice in the time-frequency plane to admit a Gabor frame with window in the Schwartz class. This criterion—a bound on the covolume that depends on the dimension of the underlying space and an index measuring the degree of non-integrality of the lattice—both recovers the known results on nonrational lattices and leads to several new results for rational ones. We are not aware of a Schwartz Gabor frame over a lattice that violates the bound.

The talk will assume no background on Operator Algebras, and can also be thought of as an introduction to the topic.