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The Fourier algebra and the group von Neumann algebra

Let R be the group of real numbers with addition and the usual topology. Then the Banach algebra $L^1(R)$ of integrable functions with convolution product can be identified via the Fourier transform with the Fourier algebra $A(R)$ which is a dense subalgebra of the algebra of continuous functions on R vanishing at infinity with pointwise multiplication.

In this talk, I will introduce the Fourier algebra $A(G)$ of a locally compact group G (not necessarily abelian) which is an algebra of continuous functions on G vanishing at infinity. It can be identified with the predual of the group von Neumann algebra of G generated by left translations on $L^2(G)$. Both the Fourier algebra and the group von Neumann algebra play a central role in harmonic analysis on non-abelian groups. In this talk, I will discuss the geometry of $A(G)$ and the Fourier Stieltjes algebra $B(G)$, the associated non-commutative function spaces in the group von Neumann algebra and some open problems.