Volker RUNDE (vrunde@ualberta.ca), Department of Mathematical and Statistical Sciences, University: University of Alberta, Edmonton, Alberta T6G 2G1, Canada, ***Abstract harmonic analysis, homological algebra, and operator spaces.***

ABSTRACT. In 1972, B. E. Johnson proved that a locally compact group G is amenable if and only if certain Hochschild cohomology groups of its convolution algebra $L^1(G)$ vanish. Similarly, G is compact if and only if $L^1(G)$ is biprojective: In each case, a classical property of G corresponds to a cohomological propety of $L^1(G)$. Starting with the work of Z.-J. Ruan in 1995, it has become apparent that in the non-commutative setting, i.e. when dealing with the Fourier algebra $A(G)$ or the Fourier–Stieltjes algebra $B(G)$, the canonical operator space structure of the algebras under consideration has to be taken into account: In analogy with Johnson's result, Ruan characterized the amenable locally compact groups G through the vanishing of certain cohomology groups of $A(G)$. This talk is intended as a survey of historical developments and current open problems.