Hypoelliptic Sobolev and Gagliardo-Nirenberg inequalities and ground states

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In this talk we discuss the dependence of the best constants in Sobolev and Gagliardo-Nirenberg inequalities on general graded Lie groups, which includes the cases of $\mathbb{R}^n$, Heisenberg, and general stratified Lie groups. Moreover, we show that critical Gagliardo-Nirenberg and Trudinger-Moser inequalities are equivalent and give the relation between their best constants. The best constants are expressed in the variational form as well as in terms of the ground state solutions of the corresponding nonlinear subelliptic equations. If time permits, we will discuss versions of the above inequalities in the settings of general noncompact Lie groups.