On a weighted Sobolev inequality in $\mathbb{R}^N$ and applications

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In this talk, we establish a new weighted Sobolev-type inequality in the whole space $\mathbb{R}^N$. We also investigate the attainability of the optimal constant associated with this inequality, providing conditions under which it is achieved. As an application of our results, we prove the existence of nontrivial weak solutions to a class of quasilinear elliptic equations of zero mass type, involving nonlinearities with both subcritical and critical growth.