In the last three years, the mathematical structure of the strong-interaction limit of density functional theory (DFT) has been uncovered [1,2,3], and exact information on this limit has started to become available. In this talk I will illustrate two examples in which this new piece of exact information can be used to treat physical situations that are problematic for standard Kohn-Sham DFT.

In the first example, more related to Physics, the strong-interaction limit of density functional theory is used to define a new framework [4] to do practical, non-conventional, DFT calculations on medium- and strongly-correlated nanodevices such as quantum dots. The second example, more related to Chemistry, shows how including the exact treatment of the strong-interaction limit into approximate exchange-correlation energy density functionals can be crucial to describe difficult situations such as the breaking of the chemical bond.