Existence, symmetry and symmetry breaking for extremal functions of some interpolation functional inequalities

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Abstract. I will present a review of some recent results on existence, symmetry and symmetry breaking of optimal functions for Caffarelli–Kohn–Nirenberg (CKN) and weighted logarithmic Hardy (WLH) inequalities. These results have been obtained in a series of papers in collaboration with M. del Pino, M.J. Esteban, S. Filippas, M. Loss, G. Tarantello and A. Tertikas. The highlights will be put on a symmetry breaking result: extremals of some inequalities are not radially symmetric in regions where the symmetric extremals are linearly stable. Special attention is paid to the study of the critical cases for (CKN) and (WLH).