Symmetry and symmetry-breaking for the fractional Caffarelli-Kohn-Nirenberg inequality

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In this talk we will consider a fractional version of the Caffarelli-Kohn-Nirenberg inequality which represents an interpolation between the fractional Sobolev inequality and the (usual or weighted) fractional Hardy inequality. Using some tools developed in conformal geometry, we will focus on three different goals. First, we review the existence and nonexistence of extremal solutions. Next, we prove some new results on the symmetry and symmetry-breaking region for the minimizers, where we will observe that the non-local version presents a contrasted behaviour from its local counterpart. Finally, we will show non-degeneracy of critical points and uniqueness of minimizers in the radial symmetry class.

This is a joint work with W. Ao and MdM. González.