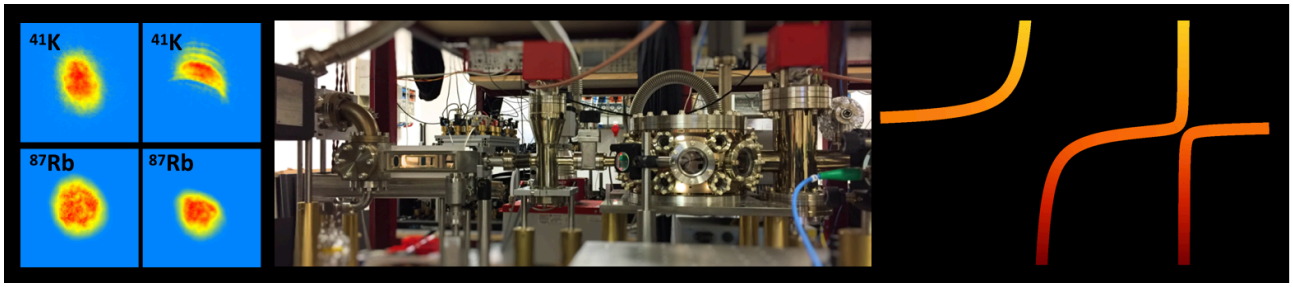

Master thesis project:

Investigation of a two species Bose-Einstein condensates of K-Rb with tunable interactions

Two species Bose-Einstein condensates are interesting for the experimental investigation of several topics ranging from the study of interacting superfluids, topological phases like solitons and vortices, beyond mean-field effects, physics of impurities (polarons), heteronuclear polar molecules, and quantum magnetism.

In this domain, we seek a master thesis student willing to investigate experimentally the superfluid properties of a Bose-Bose mixture of 41K and 87Rb as a function of the interspecies interactions controlled by means of a Feshbach resonance, in a setup recently assembled and hosted at the Department of Physics and Astronomy.

This will be the first step toward the experimental realization of a double BEC in a toroidal trap [1] where we aim to study the stability of persistent currents in a two-component superfluid [2] tuning the interspecies interactions [3], and to explore phenomena ranging from topological phases in a multiply-connected ring geometry [4] to non dissipative superfluid drag effect [5].

If you want to know more, please visit
quantumgases.lens.unifi.it/exp/krb
or email Dr. Chiara Fort (chiara.fort@unifi.it) or Dr. Francesco Minardi (minardi@lens.unifi.it)

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