



## Atom interferometry gravity-gradiometer for the determination of the Newtonian gravitational constant G

The goal of MAGIA experiment is the high precision measurement of the Newtonian Gravitational Constant G using atom interferometry.

More than 300 measurements have been done, but there are only a few methods which can be considered conceptually different: torsion balance, torsion pendulum, beam balance and pendulum cavity.

All these methods have in common that masses, which probe the acceleration caused by well known source masses, are suspended, for instance with fibers. This possible source of systematic effects can be eliminated if one performs a free-falling experiment.

Free falling Rb atoms will be used as probe masses to test the gravitational acceleration of nearby source masses. The combination of Raman atom interferometry and laser cooling will allow us to achieve high sensitivity. Using atoms with well known properties, instead of macroscopic probe masses, will help to reduce systematic errors and permit an accuracy at the level of  $10^{-4}$ .

M	isura
A	ccurata di
G	mediante
I	nterferometria
A	tomica

Go to visit the [INFN page](#) to find the experimental results.

Have a look also at the experiment to measure [gravity at micrometric distances](#).