



ADVERTISEMENT

Within the framework of the FIRB project “**Cold fluoromethane molecules for ultra-high resolution ro-vibrational spectroscopy assisted by optical frequency comb synthesizers: A laboratory test of the constancy of the proton-to-electron mass ratio**”, funded by the Italian Ministry for Education, University and Research (MIUR), the **Molecules and Precision Measurements Research Group of the Second University of Naples** invites applications for a:

3-YEARS RESEARCH CONTRACT

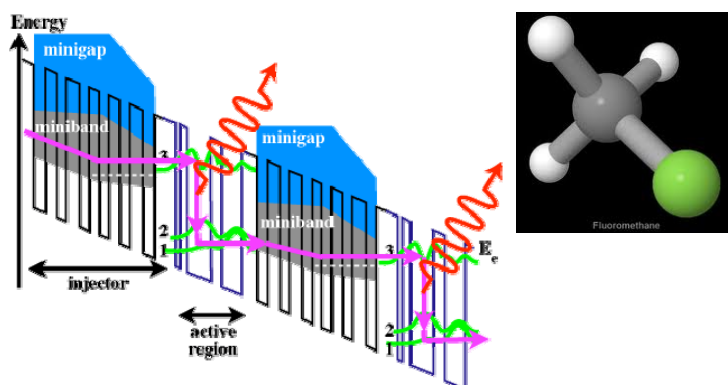
on

Frequency Stabilization of Quantum Cascade Lasers and Precision Spectroscopy of CH₃F

The project is aimed at developing the most advanced methods of ultra-high resolution molecular spectroscopy in the mid-infrared region, using frequency-stabilized quantum cascade lasers, assisted by the technology of optical frequency combs. In particular, two-photon spectroscopy shall be implemented in a high-finesse optical cavity for the observation of the fluoromethane (CH₃F) spectrum in the 9.5- μ m wavelength region.

This activity will be a part of a wider and ambitious research program, to be performed in collaboration with the National Institute of Optics of the CNR, in Pozzuoli, Napoli, and the Department of Physics, Polytechnic of Milano.

The final aim of this project is the accurate and precise determination (at a level of 1×10^{-14} !!) of the possible variation, over a time scale of one year, of the frequency of the CH₃F transition between the $\nu_3=0, J=1, K=0$ and $\nu_3=2, J=1, K=0$ vibration-rotation levels by means of a two-photon Ramsey-fringes experiment in a cold fluoromethane molecular beam. This test will provide indications on the possible variation of the **proton-to-electron mass ratio**.



In recent years, the host Research Group has become one of the leading teams in the field of Molecular Physics and Precision Measurements, as demonstrated by the publications' record.

To be eligible, the applicant should be in possession of a Master degree (preferably, in Physics or Engineering) and, possibly, should have already some research experience in a laboratory of Optics and Laser Spectroscopy. Candidates with a PhD title are also welcome, provided that they are **32 years old or younger**.

Duration: 3 years

Start date: March 2012

For further information, please contact:

Prof. Livio Gianfrani

Head of the Laser Spectroscopy and Environmental Optics Laboratories

Dipartimento di Scienze Ambientali, Seconda Università di Napoli, Via Vivaldi 43, I-81100 Caserta - Italy

Phone: ++39-0823-274632, Fax: ++39-0823-274605; E-mail: livio.gianfrani@unina2.it

or

Dr. Antonio Castrillo

Phone: ++39-0823-274617, Fax: ++39-0823-274605; E-mail: antonio.castrillo@unina2.it