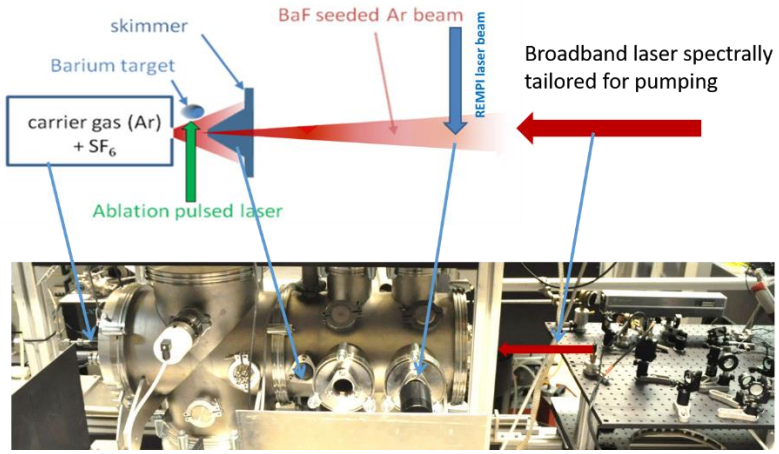
Cooling and slowing a beam of molecules

Location: Laboratoire Aimé Cotton

Researcher in charge of the Trainees: Dr. Hans Lignier

Maximum number of Trainees: 3

Experiment:



The cold molecule experiment aims at:

1) cooling the rotation and vibration of a test molecule (Barium Fluoride [BaF]) by optical methods.
2) Charging BaF molecules by the capture of electrons weakly bound to Cesium atoms prepared in a high excited state. The cesium beam is under construction.

Schedule expected:

The Trainees will participate in the measurement of the molecular yield by calibrating the detectors (Micro Channel Plates). It is worth considering the possible comparison to the result given by a quadrupole mass spectrometer (or Residual Gas Analyzer). If the conditions are met, experiment on cooling will be achieved with a new laser source.

References:

[1] M. Hamamda, P. Pillet, H. Lignier, D. Comparat, Universal deceleration of highly polar molecules. **N. J. Phys.** 17, 045018 (2015).

[2] I. Manai, R. Horchani, H. Lignier, A. Fioretti, M. Allegrini, P. Pillet, D. Comparat. *Rovibrational cooling of molecules by optical pumping.* **Phys. Rev. Lett**. 109, 183001 (2012)