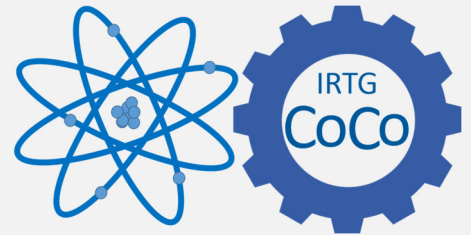


IRTG-Seminar



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“Laser cooling of CaF molecules”

Cold molecules offer exciting prospects in a range of fields, including tests of fundamental physics, cold chemistry, and quantum information. Over the last decade much progress has been made in our ability to slow molecules, using techniques such as Stark deceleration, buffer gas sources, and counter-rotating nozzles. However, the desire to produce slow and cold molecules has remained largely unfulfilled.

It has recently been shown that some molecules are good candidates for laser cooling, a technique that uses radiation pressure to permit slowing as well as cooling. I shall discuss our efforts to produce a slow beam of CaF molecules. We have demonstrated laser cooling and slowing of CaF molecules in a supersonic jet, using the A – X (0-0) transition and two vibrational repumps to allow molecules to scatter thousands of photons. Recently we have made significant changes to the experiment, using a buffer gas source to produce slow pulses of molecules, and addressing different electronic states to increase the scattering rate. I will describe recent data in which we have cooled molecules with “white light” and by chirping the laser frequencies. I will discuss plans to produce a magneto-optical trap of CaF molecules.

**Tuesday, January 12th, 2016, 4:00 p.m., HS II,
Physik-Hochhaus, Hermann-Herder-Str. 3**