

A PhD position is available in the group of Andreas Osterwalder at the Ecole Polytechnique Fédérale de Lausanne.

We study low-energy molecular collisions, using the recently developed merged beams technique which enables the observation of fundamentally important effects in molecular scattering at energies considerably below 1 K. This is achieved by making two molecular beams overlap and move in parallel. The collision energy is then determined by the velocity difference between the beams, also if they move at high velocities through the laboratory.

In recent studies we have applied this method to study Penning ionisation reactions between rare gas atoms and polyatomic molecules in order to access the low-energy stereodynamics of these reactions, as well as quantum mechanical effects like tunnelling resonances.

The principal next steps in these experiments will be to control the orientation of one or both reactants, and to extend the studies to collisions between ground state atoms and molecules.

More information can be found here:

- J. Jankunas, K. Jachymski, M. Hapka, and A. Osterwalder, *Observation of Scattering Resonances in the Penning Ionisation of ND₃ by He(³S₁) at Low Collision Energies*, J. Chem. Phys., **142**, 164305 (2015).
- J. Jankunas, B. Bertsche, K. Jachymski, M. Hapka, and A. Osterwalder, *Dynamics of Gas Phase Ne* + NH₃ and Ne* + ND₃ Penning Ionization at Low Temperatures*, J. Chem. Phys. **140**, 244302 (2014).
- J. Jankunas, B. Bertsche, and A. Osterwalder, *Study of the Ne(³P₂) + CH₃F Electron Transfer Reaction Below 1 Kelvin*, J. Phys. Chem. A, **118**, 3875 (2014).
- A. Osterwalder, *Merged Neutral Beams*, European Physical Journal Techniques and Instrumentation **2**, 10 (2015).
- J. Jankunas and A. Osterwalder, *Cold and Controlled Molecular Beams: Production and Applications*, Annu. Rev. Phys. Chem. **66**, 241 (2015).

Candidates should send a curriculum vitae, an outline of their general research interests, and contact details of at least two referees by email to andreas.osterwalder@epfl.ch.

Further information can be obtained via the same address.

This position requires acceptance in the Doctoral Program of Chemistry and Chemical Engineering (EDCH program), for which you find further information and may file an application at <http://phd.epfl.ch/edch> contact person: Ms. Anne-Lene Odegaard, annelene.odegaard@epfl.ch