

**19<sup>th</sup> December 2013 – 10:00 a.m.**  
 CFEL-bldg. 99, seminar room I and II (EG.076/078)

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## Photoelectron circular dichroism: a powerful tool to study molecular chirality in the gas phase

Over the last decade, we have demonstrated that the photoelectron circular dichroism (PECD)—the forward-backward asymmetry with respect to light's direction seen in the electron angular distributions as consequence of the interaction between circularly polarized light, and a randomly oriented chiral molecule—is a powerful and sensitive probe of molecular chirality, and of the molecular potential in general, constituting a fine test of the current photoionization models and a potential analytical tool. The introduction of electron/ion double coincidence imaging at the variable polarization DESIRS beamline (Synchrotron SOLEIL, France), has greatly advanced our knowledge of this remarkable effect. Through recent experimental examples, I will discuss the PECD enhanced sensitivity to the molecular potential compared with more common parameters such as ionization cross-sections and anisotropy parameters ( $\beta$ ), notably in clusterization processes, and vibrationally resolved PECD, where an striking dependence on the vibrational excitation of the ground state of methyloxirane cation has been observed, even resulting in the inversion of the electron forward-backward asymmetry, as seen in the Figure. Finally, the analytical implications as well as its possible role in the context of life's homochirality will be revealed.

