Plenary Talk PV XI Fri 9:00 RW 1

Tracking electron dynamics induced by attosecond pulses in bio-relevant molecules — •Francesca Calegari — Center for Free-Electron Laser Science, DESY, Notkestr. 85, 22607 Hamburg, Germany

Dynamical processes in molecules occur on an ultrafast temporal scale, ranging from picoseconds to femtoseconds when concerning with a structural change, down to attoseconds when dealing with electrons. Electron dynamics plays a very important role in bond-formation and bond-breakage, thus determining the final chemical reactivity of a molecule. Recently, theoretical studies have pointed out that after sudden ionization of a large molecule very efficient charge migration, driven by purely electronic effects, can occur on a temporal scale ranging from few femtoseconds down to tens of attoseconds. In this talk I will present advancements in attosecond technology and the application of these ultrafast light transients for the investigation of electron dynamics initiated in bio-relevant molecules. I will show that attosecond light pulses can be used to watch in real time charge migration occurring between different functional groups of aromatic amino acids such as phenylalanine and tryptophan. The same experimental approach allowed us also to measure in real-time hydrogen migration and the combined electron and nuclear dynamics triggered by sudden ionization of halogenated uracils. These findings open new important perspectives for the future understanding of the role of the electron dynamics in the photochemistry of bio-relevant molecules.