

Plenary Talk

PV VII Thu 9:00 Paulusaal

Electronic molecular movies at FLASH — ●MARKUS GÜHR
— Deutsches Elektronen-Synchrotron DESY, Notkestr. 85, 22607
Hamburg — Institute of Physical Chemistry, University of Hamburg,
Grindelallee 117, 20146 Hamburg

The conversion of light energy into molecular energy forms, such as bond formation, charge transfer, and heat, results from a concerted and ultrafast motion of electrons and nuclei. This phenomenon frequently occurs under the breakdown of the Born-Oppenheimer approximation. This presentation focuses on ultrafast experiments conducted at the free-electron laser FLASH aimed at resolving the un-

derlying electronic molecular dynamics with soft X-ray probe pulses. Utilizing the element and site specificity of soft X-rays, we extract details about valence electron dynamics on a femtosecond time scale, achieving atomic spatial resolution. Furthermore, we will present a complementary perspective on changes in nuclear geometry, providing a comprehensive understanding of the interconnected electron-nuclear dynamics in molecular photoenergy conversion.

The presentation will also provide an overview of the atomic and molecular science program at FLASH, highlighting new opportunities arising from increased coherence resulting from externally seeded operations at high repetition rates.