

PHYSIKALISCHES KOLLOQUIUM

AM 15. DEZEMBER 2014 UM 17 UHR C.T.

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UV-RADIATION DAMAGE IN DNA – RADIATION PROTECTION BY ULTRAFAST REACTIONS

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UV-irradiation by sun-light imposes a permanent menace to live on earth. UV-radiation causes serious loss of genetic information. The formation of DNA photo-lesions leads to cell death, mutations and cancer. Until now most publications on DNA-photodamage focused on single DNA-bases, where extremely rapid relaxation processes depopulate the harmful excited states and reduce the probability of damage formation. However it was shown only recently, that the real information carriers, the DNA strands, display much longer decay times.

In this talk the different issues of photolesion formation in single bases and stranded DNA are discussed. By time-resolved IR-spectroscopy in the picosecond to microsecond range we characterized the nature of the long-lived excited states in DNA. We present new observations on charge transfer in stranded DNA and discuss decay channels which may preserve the integrity of double-stranded DNA.