

Progress towards first day experiment diagnostics at FAIR

**„THE GOAL OF HEDP IS THE GENERATION, CONTROL AND STUDY OF SELF-ORGANIZED STATES FAR FROM EQUILIBRIUM IN THE PRESENCE OF INTENSE FIELDS. THIS TAKES US FROM ATTOSECONDS AND ANGSTROMS ALL THE WAY TO COSMIC LENGTH AND TIME SCALES.“
BEDROS AFEYAN**

With that goal for HEPD FAIR is right in the center with samples the size too large to be explained by idealized systems, but small enough, so we can study interesting object with astrophysical relevance in the laboratory.

In order to equip the APPA cave at FAIR with tools for the first day experiments, TUD and partners have started research and development on active and passive detector systems.

We present the progress on the development of diagnostics for FAIR Phase 0 and first day experiments on proton microscopy, on the recent results obtained at the RAL VULCAN laser on micro-structured targets for ion and X-ray production and on the development of the high repetition rate laser amplifier for the diagnostic laser at FAIR. We will also highlight diagnostic development supported by the BMBF Verbundforschung.

Based on the recent success we will present projects for the next years support PP at FAIR for the first day experiments and highlight exciting world class science using the existing facilities within the phase 0 research plans.