Laboratory Astrophysics Research at HZDR

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Abstract

The "Helmholtz-Zentrum Dresden-Rossendorf" (HZDR) research center covers a wide area of fundamental research in the fields of matter, health and energy. In particular for the first domain, a key topic is the behavior of matter in strong fields. The center operates several large-scale facilities of excellent research: The "Dresden High Magnetic Field Laboratory" (HLD), the accelerator and radiation source ELBE and the high-intensity laser system DRACO. In view of preparatory research and training for the upcoming x-ray free electron laser XFEL at Hamburg, an initiative was taken in order to combine the expertises of generating ultra-strong magnetic fields, high-power laser-matter interaction, plasma physics, radiation physics and material science. The junction of all of these fields settles exactly at laboratory astrophysics. We will present our experiences in the individual fields, outline the project and discuss possible experiments.