

ASTROPHYSICS STUDIES AT THE FUTURE ELI-NP EUROPEAN RESEARCH CENTER

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Extreme Light Infrastructure - Nuclear Physics (ELI-NP), the Romanian pillar of ELI, is under construction. The development of the high power laser system (HPLS, 2x10PW) and of the high intensity gamma beam system (GBS) have also started. The Technical Design Reports for the future experiments are in the elaboration process in the framework of large international collaborations. One of the major research areas where ELI-NP will provide a powerful tool for advancing science is nuclear astrophysics. Several experimental setups for gamma, neutron and charged particle detection will address experiments regarding the s-, r- and p-processes, stellar evolution and the CNO cycle. An overview of the proposed astrophysics studies at ELI-NP and the related setups will be given.