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Towards first experiments with brilliant gamma-beams at ELI-NP*

At the Extreme Light Infrastructure – Nuclear Physics (ELI-NP) facility, high-power laser pulses together with high-brilliance gamma beams will be the main research tools. The status of the construction of the facility, the expected parameters of the gamma-beam system and the implementation scheme of the different instruments will be reported. The emerging nuclear photonics research program at ELI-NP will be presented with emphasis on the commissioning and day-one experiments which are under preparation. The program addresses nuclear resonance fluorescence experiments, photonuclear reaction studies of interest to nuclear astrophysics, precise cross-section measurements of photoneutron reactions, studies of the strength of giant collective motions and soft modes in nuclei, photofission research and numerous applications of societal benefit. The physics cases of the flagship experiments at ELI-NP will be discussed, as well as the related instruments which are under construction for their realization.

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