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Next Generation Laser-Compton Gamma-ray Beam Facilities[1]

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Since late 1970s, laser driven Compton gamma-ray beam facilities have been developed, contradicted and operated around the world for basic science research in nuclear physics and astrophysics, and for applied research in the areas of national security and industrial applications. Currently, TUNL's High Intensity Gamma-ray Source (HIGS) located at Duke University campus is the most intense Compton gamma-ray beam facility dedicated for scientific research. Driven by a high power storage ring Free-Electron Laser (FEL), HIGS produces nearly monochromatic, highly polarized gamma-ray beams from 1 to 100 MeV, with its peak performance of total flux up to few 1E10 g/s and a spectral flux of more than 1E3 g/s/eV in the few MeV to 10 MeV region. The next generation Compton gamma-ray sources will be developed using advanced laser technologies. This talk will provide an overview of new Compton gamma-beam projects, including the ELI-NP (Extreme Light Infrastructure - Nuclear Physics) project in Romania and the HIGS upgrade project - HIGS2.

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