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”The challenge of producing narrow bandwidth high brightness gamma ray beams”

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Nuclear Photonics is an emerging field of physics research, promising new advancements both in fundamental knowledge of nuclear physics, and in envisioning new technologies for nuclear engineering, mainly in the fields of national security and radioactive waste treatment, and, eventually, astrophysics related studies. The advent of this new reasearch field is made possible by the onset of new kind of gamma ray sources, based on Compton back-scattering of high brightness electron beams by high intensity lasers. These sources aim at producing spectral densities up to 4 orders of magnitude higher than present bremstrahlung conventional sources, with very narrow bandwidth beams of gamma photons, down to 0.1%. We will discuss the rationale of these new tecnhology, and a practical example of a project presently under design in the context of the european ELI-NP initiative.

Presenter: SERAFINI, Luca (MI)

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