



## **Advancements in exploring in laser-driven acceleration for fundamental experiments and applications**

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The Extreme Light Infrastructure-Nuclear Physics (ELI-NP) is the state-of-the-art research facility in the field of photonuclear physics, an emerging interdisciplinary field that combines high-power laser systems with plasma and nuclear physics [1-2]. Fundamental research such as laser-driven acceleration mechanism under extreme intensity is studied and we aim to utilise this as a tool to provide highly-energetic charge particles and radiation sources, including ions, electrons, gamma beams and etc.

As a user facility, our mission is to attract the top researchers from the international research community to engage in the scientific activities. In our Laser-Gamma Experiment Department (LGED), we are able to perform experiments using 100 TW and 1 PW laser beamlines, mainly focus on the Laser Wakefield Acceleration (LWFA) mechanism. The laser wakefield acceleration experiments at the Extreme Light Infrastructure Nuclear Physics (ELI-NP) facility is an important new field of plasma physics and hold great promise for revolutionising particle acceleration technology.

During the commissioning of the experimental areas, we have established the basic diagnostic setups, and are committed to gradually improve them based on the

feedback from the users in collaboration with the facility. In this talk, we present an overview of our institute as a user-facility, followed by the research activities currently undertaken by the LGED department and the preliminary experimental results from the commissioning phase. Our efforts aim to advance fundamental and applied research based on high-power lasers and explore the applications of laser-driven acceleration in nuclear physics, medicine and industrial imaging.

These works were carried out with the support of contract PN23210105, funded by the Romanian Ministry of Research, Innovation, and Digitalization, and the Extreme Light Infrastructure Nuclear Physics Phase II, a project co-financed by the Romanian Government and the European Union through the European Regional Development Fund and the Competitiveness Operational Programme (No. 1/07.07.2016, COP, ID 1334).

### References

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