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## Nuclear Physics with High Power Lasers at ELI-NP facility

*Friday, 7 July 2017 11:30 (20 minutes)*

ELI-NP facility, the Nuclear Physics pillar of the Extreme Light Infrastructure under construction in Europe, will host a High Power Laser System delivering two laser beam with powers up to 10 PW and a Gamma Beam System providing high intensity, narrow bandwidth, gamma ray of tunable energy up to 20 MeV. The current achievements on proton and heavy ions acceleration with exiting 1 PW laser facilities will be review and expected improvements using 10 PW laser pulses will be presented. The high particle density and short duration of laser accelerated ion bunches are advantages that enable new methods for the study of nuclear structure and reactions compared to ion beams produced with classical accelerators. The changes of reaction cross sections or of apparent lifetimes in hot plasma environments, new techniques for heavy unstable nuclei ion production are examples that will be detailed in the presentation as well as possible applications such as medical radioisotope production. The technological chalanges of these studies will be adresssed too.

**Apply to be considered for a student award (Yes / No)?**

No

**Level for award (Hons, MSc, PhD, N/A)?**

N/A

**Would you like to submit a short paper for the Conference Proceedings (Yes / No)?**

Yes

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**Session Classification:** Nuclear, Particle and Radiation Physics 1

**Track Classification:** Track B - Nuclear, Particle and Radiation Physics