

## Advances in Laser-driven Neutron Sources and Applications at Osaka University

The evolution of laser and accelerator technologies has taken a new turn, giving rise to a new transdisciplinary field: Nuclear Photonics. Advances in high-intensity laser technologies have made it possible to accelerate electrons in the GeV class and protons close to 100 MeV from a distance of less than 1 mm. In particular, secondary beams such as laser-driven neutron sources (LDNS) are attracting much interest as a promising application of laser particle acceleration.

LDNS is attracting interest for several reasons, including (i) compactness of the source, (ii) short neutron pulses, and (iii) transportability of the laser beam. By reviewing recent activities at ILE, Osaka University, we discuss the characteristics of LDNS in comparison with accelerator-based neutron facilities. In particular, we discuss the potential and limitations of LDNS by showing that neutrons ranging from meV to MeV [1-10] in energy have been produced by LDNS and applied to neutron radiography [2,6,8], neutron spectroscopy [9,10], astrophysics [3,4], and medical science [7].

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