

Abstract Submitted
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An Ultra-Short Pulsed Neutron Source ISHAY POMERANTZ, ED-
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DITMIRE, MANUEL B. HEGELICH, Center for High Energy Density Science,
C1510, The University of Texas at Austin, Austin, Texas 78712, USA — We report
on a novel compact laser-driven neutron source with unprecedented short pulse du-
ration (<50 ps) and high flux ($>10^{18}$ neutrons/cm²/s), an order of magnitude higher
than any existing source. In our experiments, high-energy electron jets are generated
from thin (<1 μ m) plastic targets irradiated by a petawatt laser. These intense elec-
tron beams are employed to generate neutrons from a metal converter. Our method
opens venues for enhancing neutron radiography contrast, conducting time-resolved
neutron-damage studies at their characteristic evolution time-scales and for creating
astrophysical conditions of heavy element synthesis in the laboratory.

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