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Light Detection in XENON100 and Small-Scale LXe R&D Detectors

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The XENON100 experiment, installed underground at the Laboratori Nazionali del Gran Sasso in Italy, aims at detecting dark matter weakly interacting massive particles (WIMPs) scattering off nuclei within its 62 kg liquid xenon (LXe) target by simultaneously measuring the scintillation and ionization signals produced by nuclear recoils. These two signals allow the three-dimensional localization of events with millimeter precision and the ability to
fiducialize the target volume, yielding an inner core with a very low
background. I will discuss the performance of the XENON100 light detection system, based on the Hamamatsu R8520 PMT, as well as the design and performance of other special-purpose detectors built to measure the response of liquid xenon to low-energy nuclear and electronic recoils.

Primary author: Dr PLANTE, Guillaume (Columbia University)

Presenter: Dr PLANTE, Guillaume (Columbia University)

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