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LUNA results on deuterium burning and implications for cosmology

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Lightest elements were produced in the first few minutes of the Universe through a sequence of nuclear reactions known as Big Bang nucleosynthesis (BBN).
Although astronomical observations of primordial deuterium abundance have reached percent accuracy, theoretical predictions based on BBN are affected by the large uncertainty on the cross-section of the D(p,gamma;)³He deuterium burning reaction.
I will report on a new measurement of the D(p,gamma;)³He cross section performed by the LUNA collaboration to an unprecedented precision of better than 3%. This result settles the most uncertain nuclear physics input to BBN calculations and substantially improve the use of primordial abundances as probes of the physics of the early Universe.

Primary author: Dr FERRARO, Federico (Università degli Studi di Milano and INFN Milano)

Presenter: Dr FERRARO, Federico (Università degli Studi di Milano and INFN Milano)

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