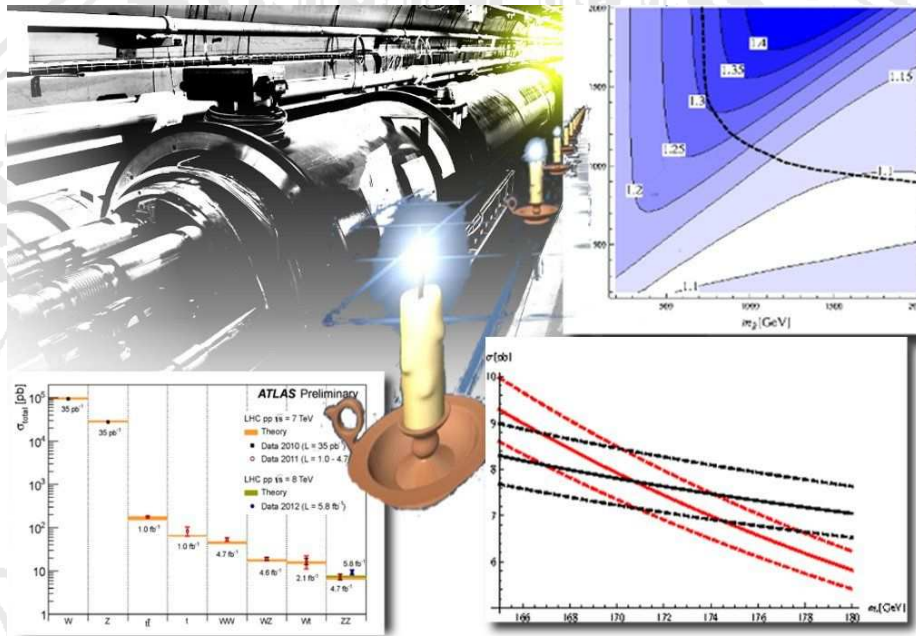


PHYSIKALISCHES KOLLOQUIUM

AM 17. DEZEMBER 2012 UM 17 UHR C.T.

IM GROßEN HÖRSAAL



PRECISE PREDICTIONS FOR STANDARD CANDLES AND NEW PHYSICS AT THE LHC AND FUTURE COLLIDERS

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While the Standard Model of particle physics provides a good description of data from collider and low-energy experiments (including the recent discovery of a Higgs-boson candidate), it cannot be a complete description of nature as indicated e.g. by the evidence for dark matter. Physics beyond the Standard Model might manifest itself directly, e.g. in the form of new particles discovered at the LHC, or indirectly through quantum corrections on precision observables. Precise theoretical predictions are required in both scenarios: for "standard candle" processes that allow to measure input parameters of the standard model (e.g. the top-quark and W-boson masses) and for production processes of new particles in order to distinguish different possible extensions of the standard model.

In this talk I will describe methods and examples for precise calculations, both for direct production processes of new particles (exemplified by supersymmetric partners of quarks and gluons) and for processes relevant for the top-quark and W-boson mass measurements at the Tevatron, the LHC and a planned future electron-positron collider.