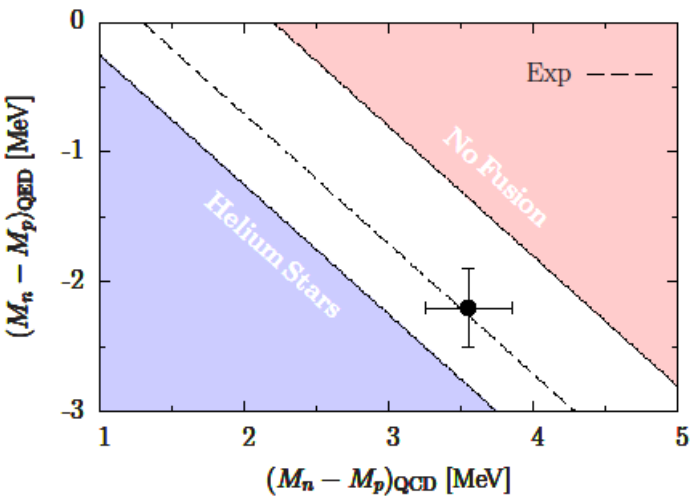
DESY
Physics Seminar

Lattice QCD + QED: Towards a Quantitative Understanding of the Stability of Matter.

Gerrit Schierholz (DESY)

Tuesday, 26 January 2016, 16:45 h, DESY Auditorium



The Universe as we know it is highly sensitive to the size of the n – p mass difference. If it would be larger than the binding energy of the deuteron, no fusion would take place. If it would be only a little smaller, all hydrogen would have been burned. Though it is one of the most consequential parameters of physics, the n – p mass difference is not a primary quantity. The relevant theories for the calculation are QCD and QED. With strong and electromagnetic effects being of the same order of magnitude and strongly correlated, this makes a nonperturbative evaluation necessary. For the first time both QCD and QED are now included in the same nonperturbative calculation, which allows us to predict isospin breaking effects in the meson, baryon and quark sectors from first principles, and in particular the n – p mass difference.

- **Coffee, tea and cookies will be served at 16:30h**
- **After the seminar there is a chance for private discussions with the speaker over wine and pretzels**