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## Precision Hadron Structure

*Thursday, 29 May 2025 14:00 (30 minutes)*

Nucleons are the building blocks of atomic nuclei, and are responsible for more than 99 % of the visible matter in the universe. Around 50 years after the establishment of Quantum Chromo Dynamics as the quantum field theory describing the strong interaction within the Standard Model of particle physics, the precise way in which the quarks and gluons compose the nucleon and build up its global properties, i.e. its mass, momentum, charge, or spin distributions, as well as give rise to its excitation spectrum are still challenging our understanding. Accurate knowledge about e.g. the proton charge radius is not only essential for understanding how QCD works in the non-perturbative region, but also important for bound state QED calculations of atomic energy levels. In this talk, I will review the progress achieved in exploring nucleon structure both through hard processes and through measurement of low-energy precision quantities. It will be shown how the three-dimensional momentum-space imaging and tomography of the proton, as well as of nucleon resonances, is connected to low-energy structure quantities such as charge radii and polarizabilities which are crucial inputs in the interpretation of precision atomic spectroscopy experiments.

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