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PROF. JOHN PEACOCK Royal Observatory, Edinburgh Cosmology from large-scale structure: concordance and discordance

The patterns in the distribution of the galaxies are the largest physical structures known, and represent relics of the earliest phases of the expanding universe. Their evolution depends on the cosmic matter content, and so large-scale structure has given us precise insights into the dark makeup of the universe – as well as the ability to measure the strength of gravity on cosmic scales. I will review these achievements, together with the outlook for greater precision still from the

next generation of forthcoming experiments. The subject stands at an interesting crossroads, where many measurements are closely consistent with a simple standard model, and yet there are small failures in agreement between different experiments (“tensions”), indicating either possible new physics or undiagnosed systematics. I will discuss how our statistical approach may need to evolve in order to deal with cosmological experiments that are limited by systematics.

