Weak gravitational lensing as a probe of the dark matter distribution

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Gravitational light deflection offers a unique tool to study directly the distribution of matter in the Universe, irrespective of its nature. In this talk I shall describe briefly the basics of weak lensing, before turning to several applications, including (1) the search for, and detection of cluster-mass matter concentrations, (2) lensing by the large-scale inhomogeneous matter distribution in the Universe and its role in determining cosmological parameters and (3) the investigation of the relation between the dark matter distribution and the large-scale distribution of galaxies, e.g. the biasing of galaxies. Future perspectives concerning new instrumentations just coming on-line will be outlined.