# Perspectives of future X-ray astronomical polarimetry

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X-ray polarimetry is one of perspective methods of the X-ray astronomy. Since the first discovery of X-ray sources the theory has predicted a high degree of polarization that could be expected owing to electron scattering and non-thermal emission mechanisms. The conventional polarimetric techniques are based on Compton scattering and Bragg diffraction. The latest developments are outlined to design sensitive X-ray polarimeters based on the photoelectric effect and most recent micropattern detectors. The latter will be installed in the focus of XEUS-1. In my talk I formulate some new problems that can be solved directly via X-ray polarimetry. X-ray polarimetry is the most effective tool for investigating quantum electrodynamical effects of vacuum polarization and birefringence in extreme magnetic fields. Also, I show how: (a) it is possible via X-ray polarization to distinguish between rotating Kerr and non-rotating Schwarzschild black holes, (b) to derive the dimensionless rotation parameter $a/M$, (c) to determine the magnitude and structure of the magnetic field in the nearest environment of black holes (the inner radius of an accretion disk, a marginally stable orbit). I show that Faraday rotation of polarization plane in electron scattering affects essentially the wavelength dependence of X-ray polarization.