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Magic mirrors and magic windows

Monday 19th February - h 14:00
Sala “Luigi Stringa” FBK

Abstract:
Ancient oriental mirrors possess a property that seemed magical and was probably unintended by those who made them: the pattern embossed on the back of such a mirror appears in light reflected onto a screen from its apparently featureless front surface. In reality, the embossed pattern is reproduced on the front, in low relief invisible to direct observation, and analysis shows that the projected image results from pre-focal ray deviation. In this interesting regime of geometrical optics, the image intensity is given simply by the Laplacian of the height function of the relief. Observation confirms this ‘Laplacian image’ interpretation. Current research aims to create the transparent analogue of the magic mirror: ‘magic windows’, in which glass sheets, flat to unaided vision, concentrate light onto a screen with intensity reproducing any desired image. Laplacian image theory implies that the desired surface relief is obtained by solving Poisson’s equation.

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