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Evidence of the past activity of the Black Hole at the center of our Galaxy by X-Ray polarimetry

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The first spectral images of the environment surrounding SgrA suggested the co-existence of thermalized plasma with extended regions showing the typical spectrum of a “cold” matter irradiated by a flux of hard X-Ray. In 2002 E.Churazov, R.Sunyaev and S.Sozonov proposed to measure the polarization of this reflected component in the brightest molecular cloud around the Galactic Center, SgrB2, to derive the distance of the source and the evidence of a brightening a few centuries ago. Since then the polarimetry of the molecular clouds has been one of the clue in mission proposals. The fast changes in the emission detected with Chandra on one side confirmed the reflection but on the other side forced to a frequent rethinking of the targets. In view of the IXPE launch the target chosen by a team lead by F. Marin was the Sgr A cloud. A long observation in 2022 gave the evidence of reflection from a source compatible with SgrA, corresponding to a flare occurred around 200 years ago. This is only a start but these observations are heavily time demanding.

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