



# - RAY ASTRONOMY 2019

*Current Challenges and New Frontiers in the Next Decade*

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## Sgr A\* recent past activity from the X-ray echoes propagating in the Central Molecular Zone

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Variable X-ray emission from the clouds of the Central Molecular Zone (CMZ) are attributed to the reflection of radiation emitted by the super-massive Black Hole of the Galaxy, Sgr A\*, during outbursts occurred in the recent ( $< 1000$  yr) past.

Thanks to a detailed analysis of the XMM and Chandra data of the Galactic Center, based on the comparison of observed spectra and Monte Carlo modelling of the reflection process, we succeeded to determine the line of sight position of a number of molecular clouds that are reflecting the radiation towards us, providing at the same time a significant measurement of the time delay of the events.

This analysis allowed us to prove at the significance level of more than 5 sigma the presence of at least two independent, luminous (1 million times the present Sgr A\* X-ray luminosity) events propagating in the CMZ: one short generated about 85 yr back and lasting 1 year and another longer emitted by Sgr A\* about 240 yr ago and which lasted about 20 yr. Prospects for determining the X-ray light curve of Sgr A\* in the last millennium through this technics are improving and such measurements will surely be completed with the next generation of X-ray instruments.

### Topic

Compact and diffuse sources in galaxies and in the Galactic Center

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