



X-RAY ASTRONOMY 2019

Current Challenges and New Frontiers in the Next Decade

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Probing the tenuous interstellar dust medium using soft X-ray absorption features

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The interstellar dust permeates our Galaxy and plays a crucial role in star formation processes. It can control the temperature of the ISM and it is the catalyst for the formation of complex molecules. However, the exact chemical composition of dust grains is not yet fully understood. Insights can be gained by combining X-ray observations and laboratory measurements. High resolution X-ray spectroscopy of bright background sources gives the ideal workbench to study the chemical composition of dust in diffuse regions of the ISM through the absorption features of dust and gas. In particular, here we focus on the Fe L and O K absorption edges, two among the most abundant elements that determine the chemical composition of dust grains. For our spectral modelling we obtained new laboratory measurements of dust scattering and calculated the corresponding cross sections for samples of different chemical composition. The measurements were acquired with the Electron Energy Loss Spectrometer in Cadiz. Lastly, we examine systematic divergencies in the atomic (gaseous phase) data of the oxygen edge using different X-ray atomic databases.

Topic

Compact and diffuse sources in galaxies and in the Galactic Center

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