Contribution ID: **56** Type: **Invited**

A new era of high-resolution spectroscopy in X-ray astronomy

Thursday 10 October 2024 15:40 (30 minutes)

The field of X-ray astronomy has entered an era of spatially-resolved high-resolution spectroscopy, as driven by the technology of microcalorimeters. Through sounding-rocket experiments and the (brief) Hitomi mission in the past, the scientific potential of a microcalorimeter-based X-ray spectrometer is well illustrated and is highly exciting. All eyes are now on XRISM, with the expectation of scientific breakthroughs. Looking further into the future, ESA has approved the NewAthena satellite for launch in the late 2030s, while key technology development is ongoing for HUBS in China and LEM in the US. These missions will employ a new generation of microcalorimeters, based on superconducting technologies, which are expected to deliver even more superior spectral resolution. In this talk, I will briefly describe the development in the case of HUBS, and highlight some of the unresolved scientific issues that are expected to be addressed in the new era of the field.

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Session Classification: Future missions