

NEXT GENERATION X-RAY SPECTROMETRY INSTRUMENTS FOR SPACE EXPLORATION

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Dramatic advances in the technology for X-ray spectrometry in recent years have reduced the mass, power, and volume of instruments while increasing performance. This has large implications for the design of instruments to be carried to other solar system bodies by spacecraft.

We will review some of the advances in sources, window materials, detectors, and pulse processing to assess how they might improve instrument design and performance. The emphasis will be on instruments for planetary exploration, especially those to perform elemental analysis of planetary regolith. The advances in X-ray technology can enable new approaches to instrument deployment and permit new types of measurements, such as subsurface stratigraphy.

Our goal is to outline a series of components that take advantage of the technology improvements and that could be combined into several possible configurations for different space missions.