

X-ray views of the Sun – A Rocket Journey

Professor Athiray Panchapakesan

University of Alabama in Huntsville

Our Sun is an excellent but complex astrophysical laboratory to understand the dynamics of plasma heating and particle acceleration. Observing the outermost solar atmosphere, called the corona, in X-rays via imaging and spectroscopy offer several radiative diagnostics, which helps us to explore the plasma parameters and predict space weather events. In this talk I will share some fascinating facts about the high energy aspects of the Sun. I will then describe two successful heliophysics sounding rocket missions, viz FOXSI* and MaGIXS**, which employ novel next generation space instrumentation to observe X-ray emission from the solar corona. I will share my experiences participating in the rocket launch campaigns while also playing a lead role in the instrument development and calibration.

*Focusing Optics X-ray Solar Imager

**Marshall Grazing Incidence X-ray Spectrometer

Dr. Panchapakesan completed his PhD from the Indian Space Research Organization, working with X-ray instruments aboard the Indian Moon missions Chandrayaan-1 and -2. His PhD research was on the study of surface chemical composition of the Moon using space-based X-ray fluorescence experiments. His passion has always been space science and instrumentation development. After his Phd, Dr. Panchapakesan joined as a post-doctoral associate at the University of Minnesota with the FOXSI sounding rocket team, which was an X-ray telescope to study the atmosphere of the Sun. He was the detector team lead at UMN responsible for detector tests and calibration, and he actively participated in the successful launch of the instrument. Next, he won the prestigious NASA Postdoctoral fellowship, joined NASA Marshall Space Flight Center as the calibration lead for the development of the next generation sounding rocket instrument MaGIXS, which is the first instrument that uses slitless X-ray imaging spectroscopy to study the Solar corona. Currently Dr. Panchapakesan is a faculty member at the University of Alabama in Huntsville, where he continues working closely with NASA solar missions exploring the solar atmosphere via X-ray imaging and spectroscopy.