

# **Recent Advances in Observations and Modeling of the Solar Ultraviolet and X-ray Spectral Irradiance**

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There have been significant, recent advances in understanding the solar ultraviolet (UV) and X-ray spectral irradiance from the several different satellite missions and from new efforts in modeling the variations of the solar spectral irradiance. The recent satellite missions with solar UV and X-ray spectral irradiance observations include the X-Ray Sensor (XRS) aboard the series of NOAA GOES spacecraft, the Upper Atmosphere Research Satellite (UARS), the SOHO Solar EUV Monitor (SEM), the Solar XUV Photometers (SXP) on the Student Nitric Oxide Explorer (SNOE), the Solar EUV Experiment (SEE) aboard the Thermosphere, Ionosphere, Mesosphere, Dynamics, and Energetics (TIMED) satellite, and the Solar Radiation and Climate Experiment (SORCE) satellite. The combination of these measurements is providing new results on the variability of the solar ultraviolet irradiance throughout the ultraviolet range shortward of 200 nm and over a wide range of time scales ranging from years to seconds. The solar UV variations of flares are especially important for space weather applications and upper atmosphere research, and the period of intense solar storms in October-November 2003 has provided a wealth of new results about solar flares. The new efforts in modeling these solar UV spectral irradiance variations range from simple empirical models that use solar proxies to more complicated physics-based models that use emission measure techniques. These new models provide better understanding and insight into why the solar UV irradiance varies, and they can be used at times when solar observations are not available for atmospheric studies.