

# Low-Energy Microfocus X-Ray Source for Enhanced Testing Capability in the Stray Light Facility

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## Sponsoring Program(s)

Marshall Space Flight Center/Center Management and Operations  
Technology Investment Program

## Project Description

Research toward high-resolution, soft x-ray optics (mirrors and gratings) necessary for the next generation large x-ray observatories requires x-ray testing using a low-energy x-ray source with fine angular size (<1 arcsecond). To accommodate this somewhat demanding requirement, NASA Marshall Space Flight Center (MSFC) has procured a custom, windowless low-energy microfocus (~0.1 mm spot) x-ray source from TruFocus Corporation that mates directly to the Stray Light Facility (SLF) (fig. 1).

MSFC X-ray Astronomy team members are internationally recognized for their expertise in the development, fabrication, and testing of grazing-incidence optics for x-ray telescopes. One of the key MSFC facilities for testing novel x-ray instrumentation is the SLF. This facility is an ~100-m-long beam line equipped with multiple x-ray sources and detectors. This new source adds to the already robust compliment of instrumentation, allowing MSFC to support additional internal and community x-ray testing needs.

This new windowless (low-energy) source has an aluminum target and adjustable focal spot size of 100 to 150 μm and can operate from zero to 10 V and zero to 2 mA.<sup>1</sup> Figure 2 is an image taken of the front of the control panel, with primary features labeled.

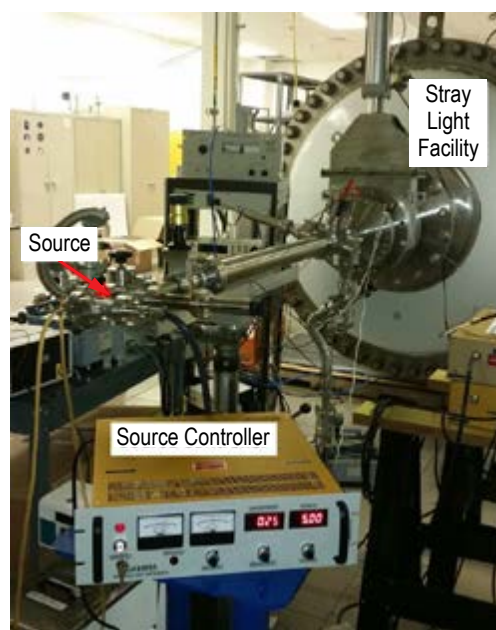


Figure 1: TruFocus x-ray source attached to MSFC's Stray Light Facility.

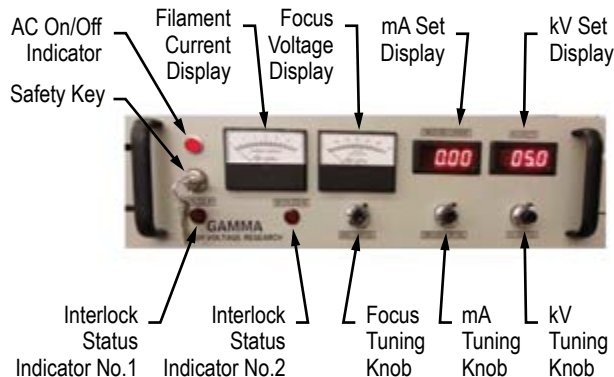


Figure 2: Image of the front of the source controller/power supply.

### *Anticipated Benefits*

MSFC is currently involved in several internal and external projects related to the testing of high-resolution x-ray optics and gratings. Meeting science requirements and extending these and new collaborations to subsequent technology development proposals hinges significantly upon MSFC's capabilities in performing existing x-ray testing needs.

### *Potential Applications*

Enhancing MSFC's capability to test state-of-the-art, high-resolution x-ray optics and gratings allows MSFC to maintain its status as a world-class facility for such work. Applications include testing from internal and external NASA sources.

### **Notable Accomplishments**

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This source has been tested at MSFC with a stable response over the course of several days. Further testing is planned.

### **References**

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1. TruFocus User Guide, "Low Energy X-ray Sub-System: (Source) TFS-10-2-AL-Sub, (Power Supply) PS-10-2-G.