

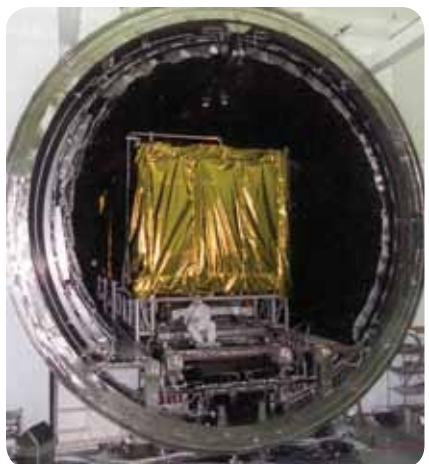
NASA's Strategic Capabilities Assets Program

NASA MARSHALL SPACE FLIGHT CENTER THE X-RAY AND CRYOGENIC FACILITY



UNIQUE WORLD-CLASS OPTICAL, CRYOGENIC, AND X-RAY FACILITY

The X-Ray and Cryogenic Facility (XRCF) at NASA Marshall Space Flight Center—built in 1991 to calibrate the Chandra X-ray Observatory High Resolution Mirror Assembly—was modified in 1994, 1999, and 2005. This large chamber can achieve high vacuum levels with a very clean pumping capability through the use of cryogenic and turbo-molecular vacuum pumps. It can also support six degrees of freedom, providing vibration isolation and two motion stages. Unique capabilities of the XRCF include x-ray calibration and performance testing of large grazing-incidence x-ray optics, detectors, and telescopes, as well as cryogenic optical metrology of large direct-incidence optics. In addition to the optical and thermal instrumentation feedthroughs, the chamber also provides numerous electrical and fluid feedthroughs. Uses to date of the XRCF have included x-ray optics and detector calibration, thermal cycle and balance testing of instruments, dynamic characterization testing of inflatable structures, cryogenic testing (<-400 °F) of direct-incidence optics and composite structures, and thermal structural deformation testing. The chamber is currently dedicated to testing for the James Webb Space Telescope but will be available for new work starting in late 2011.



Optical view ports	5.875" BK7 window
Optical instrumentation	WaveScope, PhaseCam, and IPI
Thermal instrumentation	Silicon diodes and thermocouples
Test volume	20 feet in diameter x 60 feet deep
Ultimate pressure	10 ⁻⁸ Torr
Test volume thermal limits	-160 °F to +160 °F
Clean room	60 feet x 90 feet—Class 1,000
Enclosures capable of operating in -424 °F to +120 °F	10 feet x 8 feet x 30 feet
	16.5 feet in diameter x 31 feet
Clean room crane	20 ton with 29 feet hook height
Refrigeration capability	1 kW at 200 K

CONTACT INFORMATION

<http://optics.nasa.gov/facilities/xraycal.html>

Jeff Kegley

NASA Marshall Space Flight Center

(256) 544-2291

E-mail: jeff.kegley@nasa.gov