



UVIT UV AIT facilities

John Hutchings

NRC Canada



ASTROSAT observatory



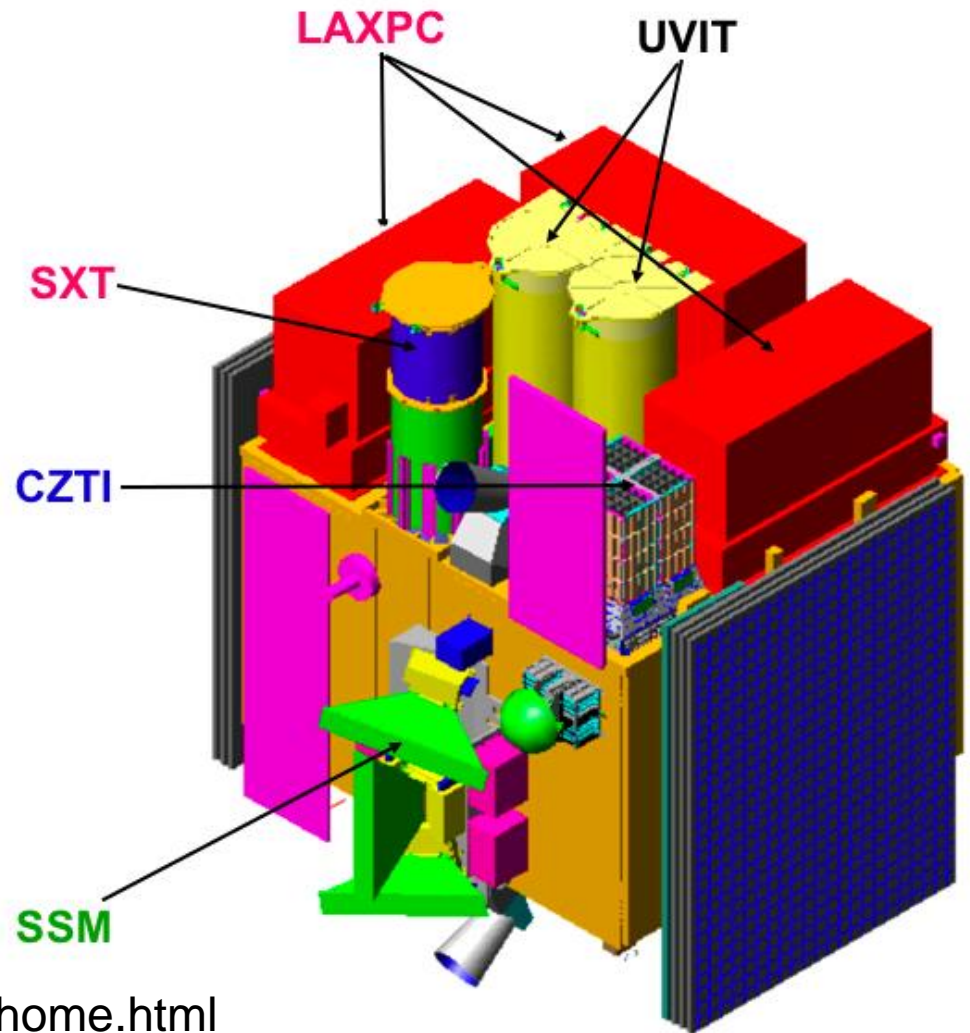
Large Area X-ray Proportional Counter

Ultra-Violet Imaging Telescopes

Soft X-ray Telescope

Cadmium Zinc Telluride Imager

Scanning Sky Monitor



Launch 2014, >5 year life

<http://meghnad.iucaa.ernet.in/~astrosat/home.html>

Instrument summary

	UVIT / OPT	SXT	LAXPC	CZTI	SSM
Optics	Twin Ritchey Chretien 2 mirror system.	Conical foil (~Wolter-I) mirrors	Collimator	2- D coded mask	1- D coded mask
Bandwidth	1300-3200 Ang	0.3 - 8 keV	3 - 100 keV	10 - 100 keV	2 - 10 keV
Geometric Area (cm²)	1250	250	10800	1000	180
Effective Area (cm²)	60 (depends on filter)	125@0.5 keV 200@1-2 keV 25@6 keV	6000@5-30 keV	1000 (E>10 keV)	~40 @ 2 keV 90 @ 5 keV (Xe gas)
Field of View	0.50 ^o dia	0.35 ^o (FWHM)	1 ^o x 1 ^o	17 ^o x 17 ^o	6 ^o x 90 ^o
Energy Resolution	<1000 A (depends on choice of filters)	2%@6keV	9%@22 keV	5% at 10 keV	19% @ 6 keV
Angular Resolution	1.8 arcsec	3 - 4 arcmin (HPD)	~(1-5) arcmin (in scan mode only)	8 arcmin	~10 arcmin
Time resolution	10 ms	2.6s, 0.3s, 1ms	10 microsec	1 ms	1 ms

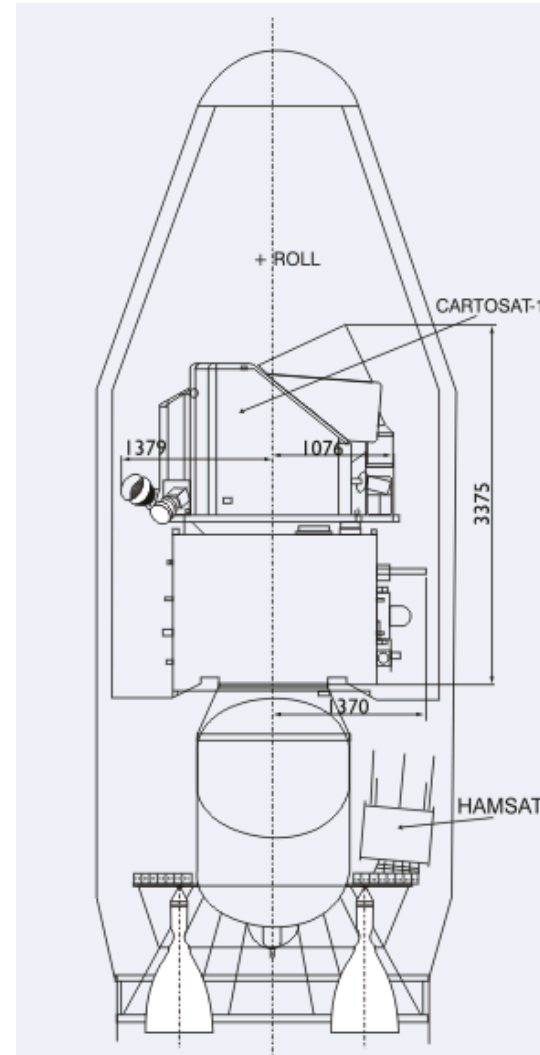


ISRO Overview



Budget \$1.5B (6600 Crore Rupees)
Employs ~15000 persons (NASA has 18000)
Main launch vehicles PSLV and GSLV
Centres across the country include hardware production

PSLV launch vehicle





ISRO/Astrosat centres





ISRO Astrosat-related centres



Bengaluru

ISRO headquarters

ISRO (ISAC)

Main integration and Spacecraft
Astrosat Project Director (PD)

ISRO (ISITE)

Satellite Integration and Test Establishment

ISRO (ISTRAC)

Ground operations – tracking and telemetry

IIA Koramangala

UVIT science team and data centre

Hyderabad

National remote Sensing Centre (NRSC) Astrosat command

Ahmedabad

Space Applications Centre (SAC) Data pipeline development

Hoskote (outside Bengaluru)

IIA CREST-campus cleanroom Integration and test of UVIT

Sriharikota East coast ISRO launch facility

Mumbai (TIFR) and Pune (IUCAA) – teams for X-ray instruments and data



Canadian facilities

Univ of Calgary

UV calibration lab and cleanroom

CSA David Florida Lab Ottawa

Large I+T TVAC facility

CSA contractors, Ottawa

Small TVAC and cleanrooms



UV-contamination notes



Canada

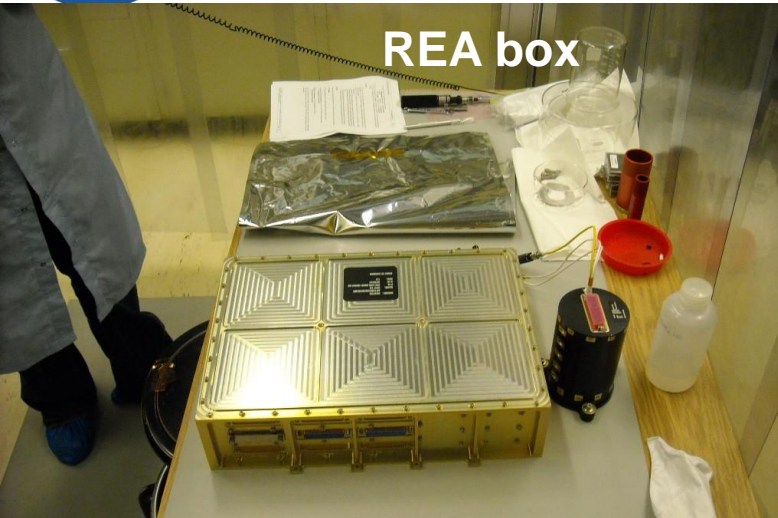
Cleanliness in front-end module – Photek UK and suppliers

Attention paid to potting agent – Arathane used.

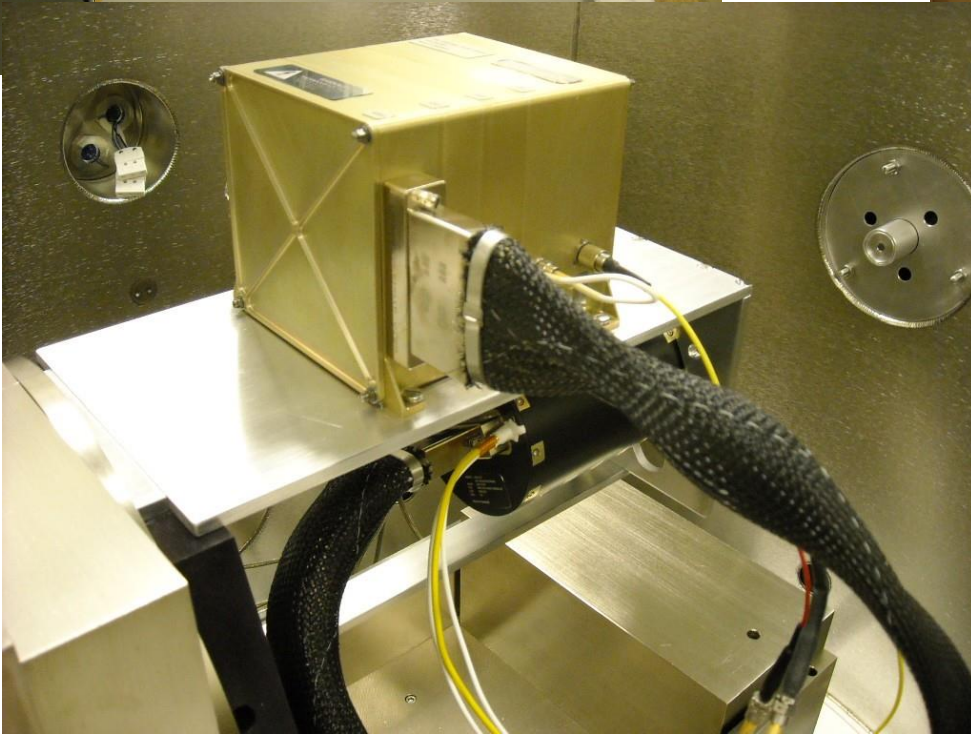
Cleaned vacuum chambers and monitored witness samples at each step

Upgraded clean calibration facilities for all calibration and witness samples

No measurable contamination (<1%) found up to delivery



Tank with lid just raised



**EM + HVU mounted
inside the tank**



India facilities

New cleanroom facility built at IIA-CREST, Hoskote, for UVIT
3 rooms with increasing levels of cleanliness
Class 100 bench with curtains in final room
Access to vacuum chamber from cleaner side
Control of Vac tests from middle chamber.
All storage sealed, and clean protocols for personnel.

No appreciable degradation at shortest wavelengths at 2009 delivery
Long term storage has seen a few percent reduction in FUV to 2013

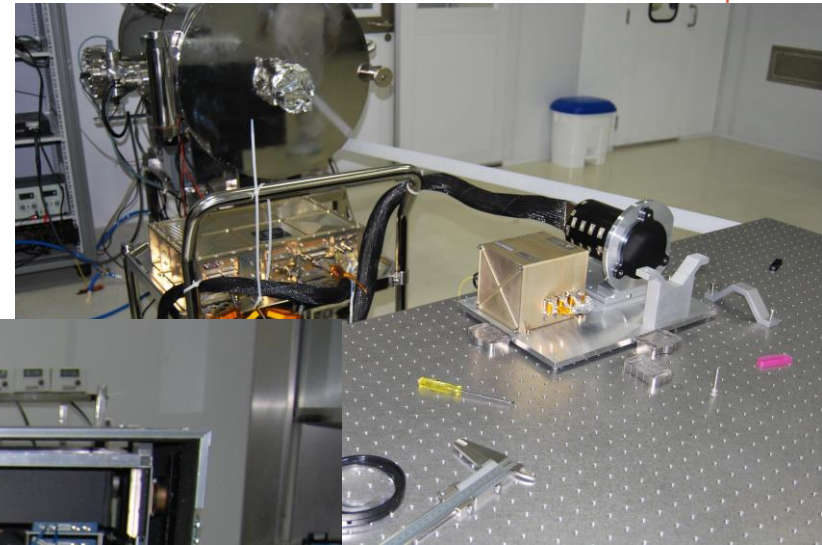
ISAC and ISITE clean procedures upgraded for UVIT
UV contamination is new for ISRO, but looks good now.
ISITE preferred clean location. Large cleanroom for Vib
Cleaned vacuum chamber
Instrument bagged and purged between tests and in transport
Instrument door has window for NUV and VIS testing



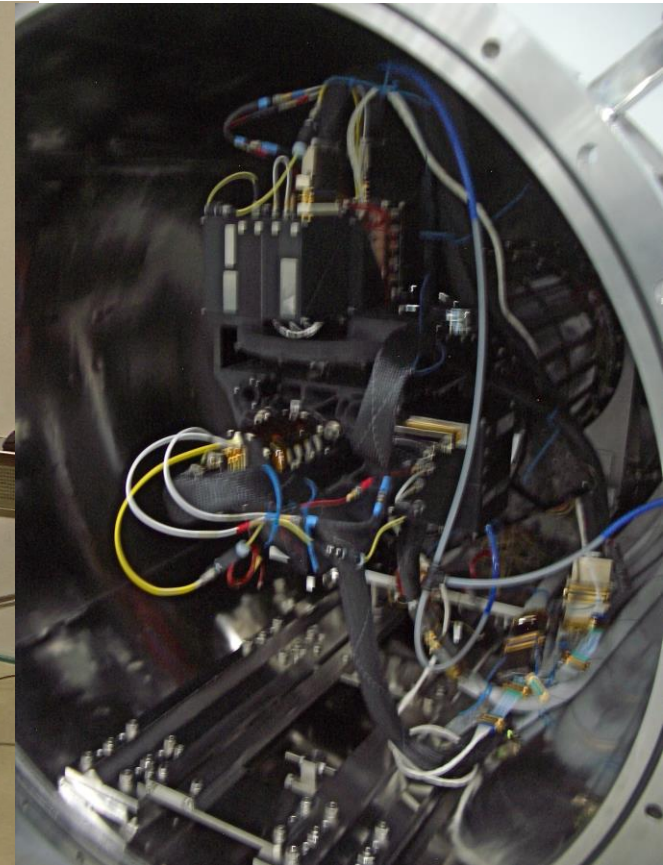
Hoskote CREST integration facility



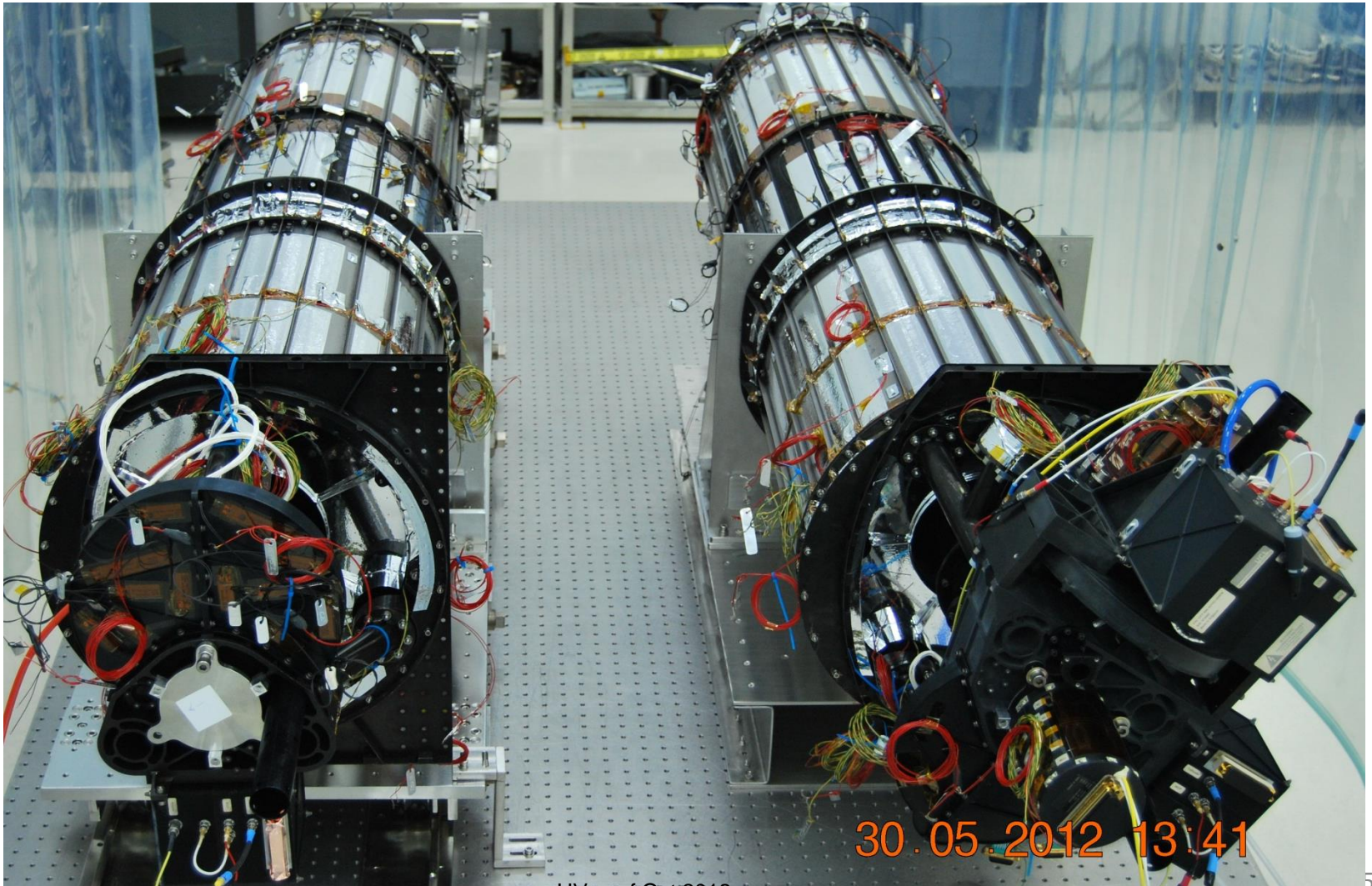
In the Hoskote cleanroom



NUV/VIS in the CREST cleanroom



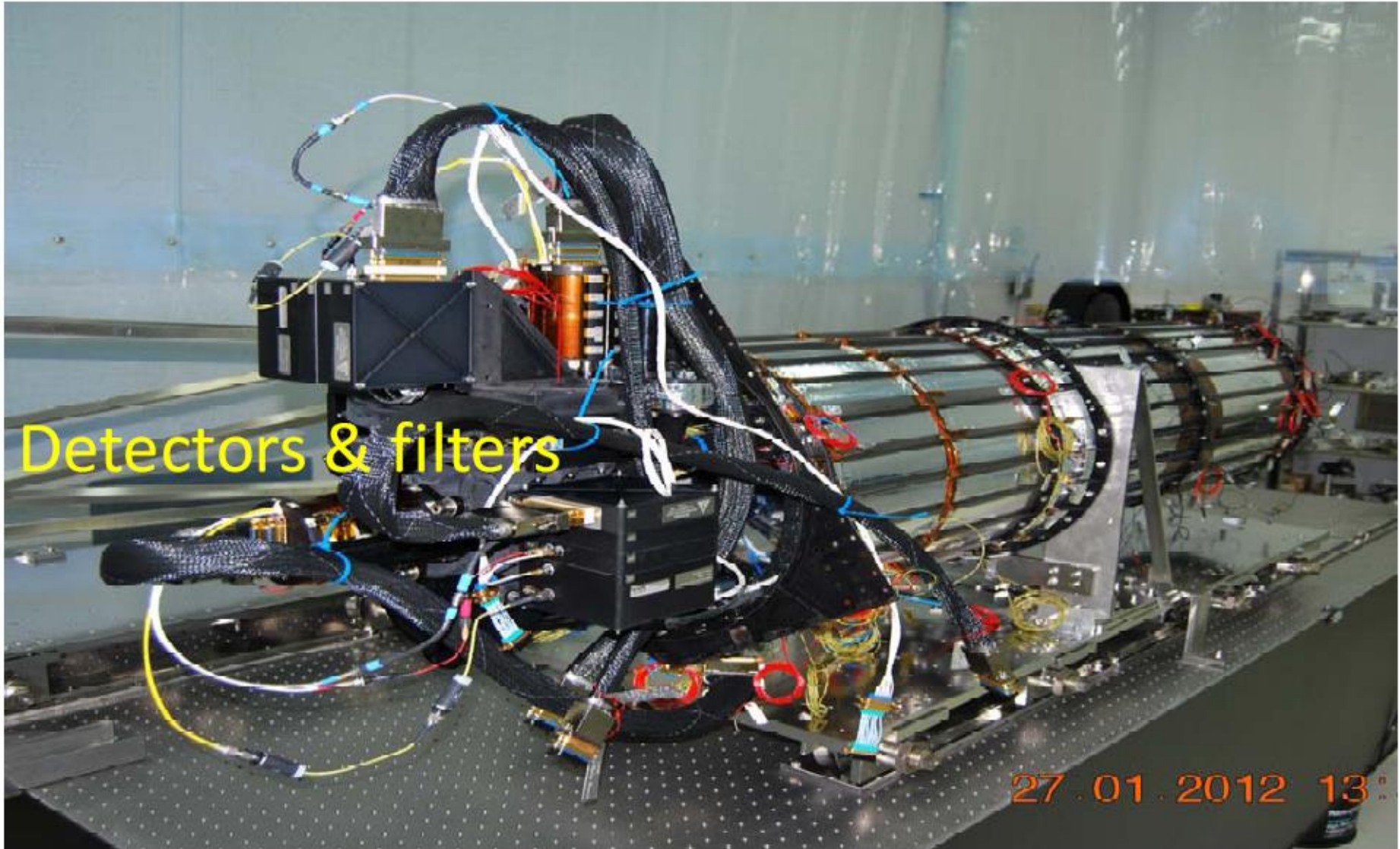
Integrated UVIT Payload in 100Class



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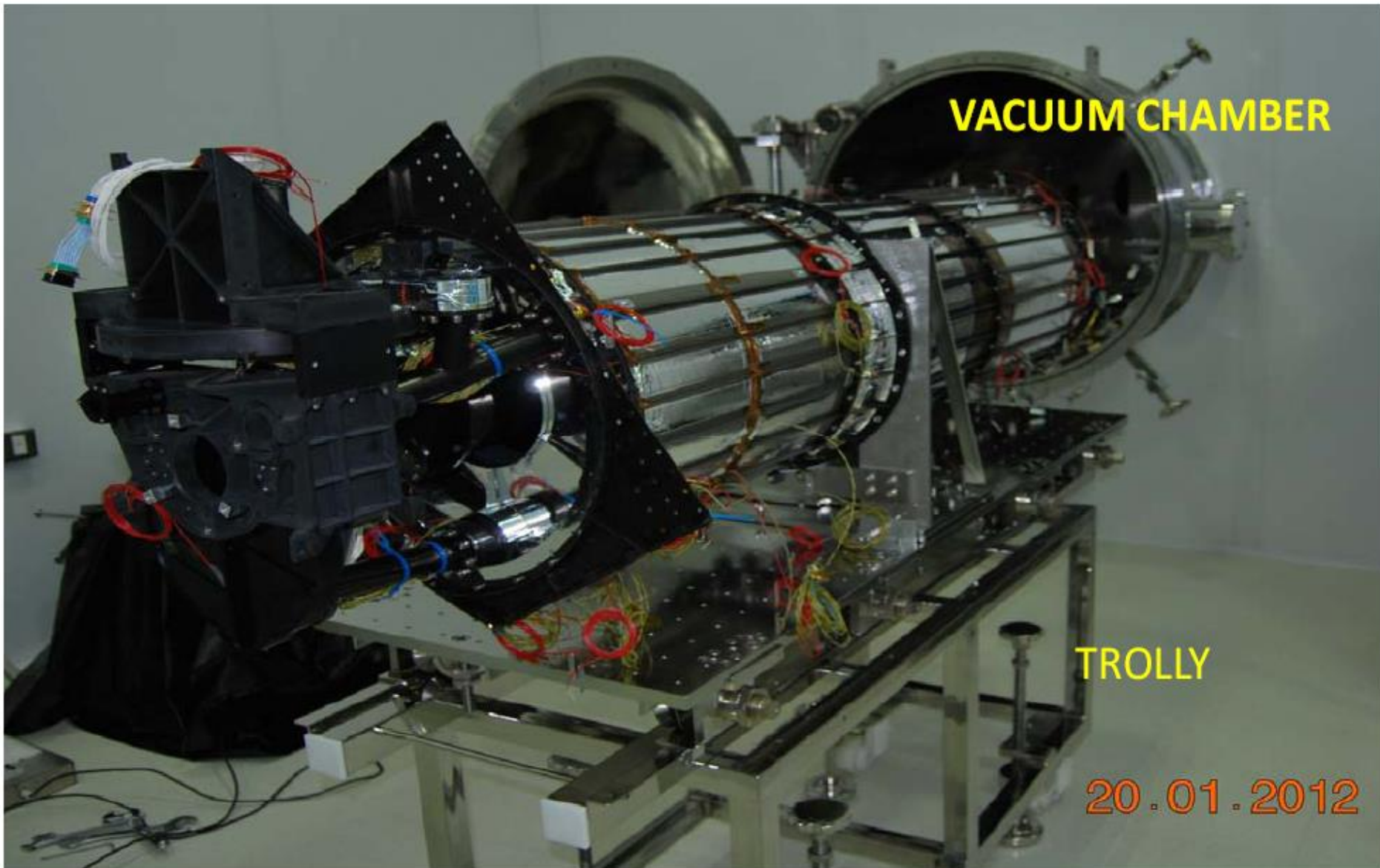
NUV/VIS Telescope of UVIT

at CREST, IIA



NUV/VIS telescope of UVIT

being placed in vacuum chamber at CREST, IIA



INTEGRATION IN PROGRESS



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