

Observing facilities in India

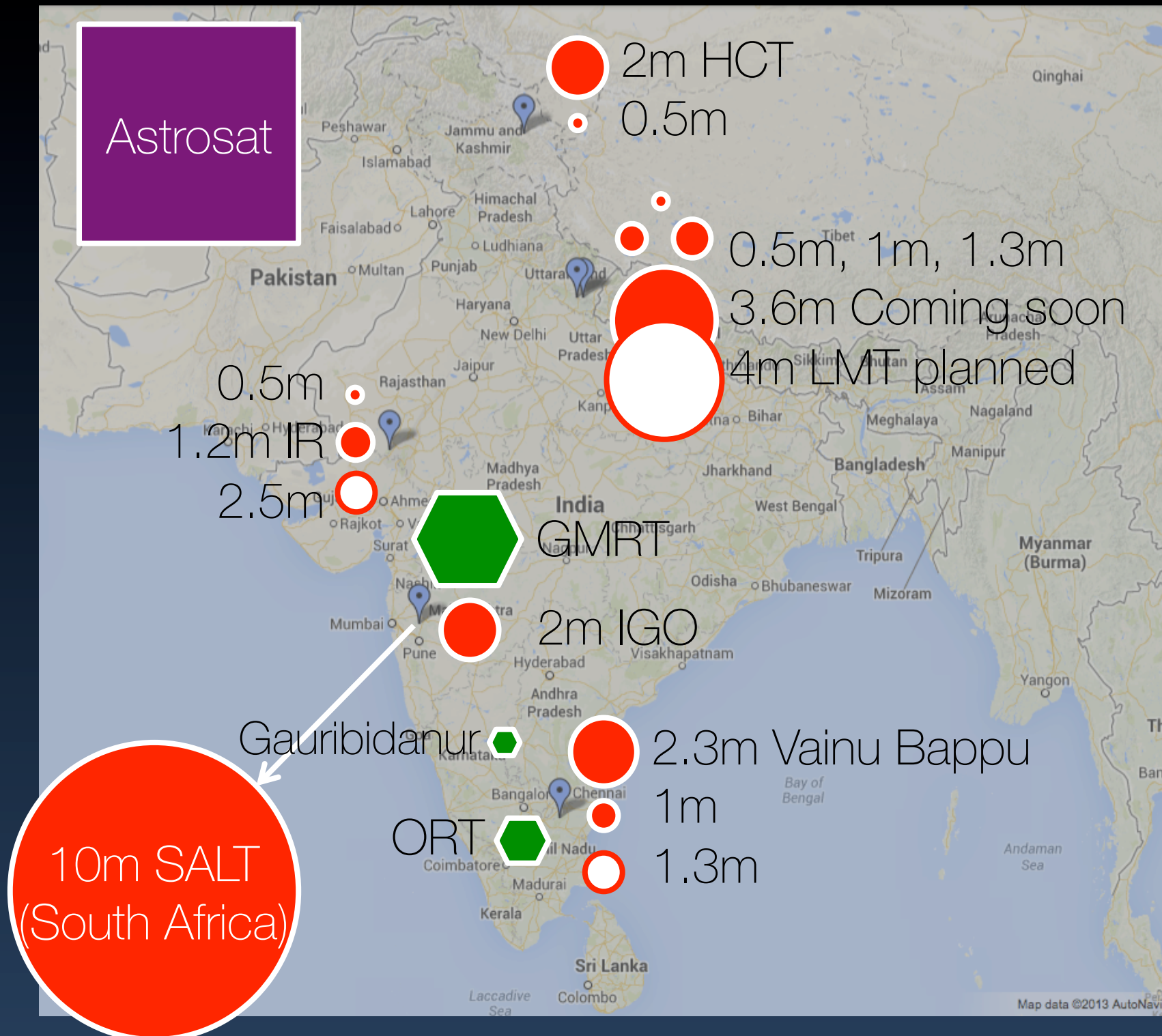
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Large Indian Telescopes



Optical / Infrared

- 2m Himalayan Chandra Telescope (IIA)
- 2m IUCAA Girawali Telescope (IUCAA)
- 1.2m Mt. Abu IR Telescope (PRL)
- 3.6m ARIES Telescope (ARIES)
- 1.3m Devasthal Fast Optical Telescope (ARIES)
- 1.3m Kavalur Telescope (IIA)



Himalayan Chandra Telescope (HCT)

2m Imaging + Spectroscopic
telescope

Site: Digpa-ratsa Ri, Hanle

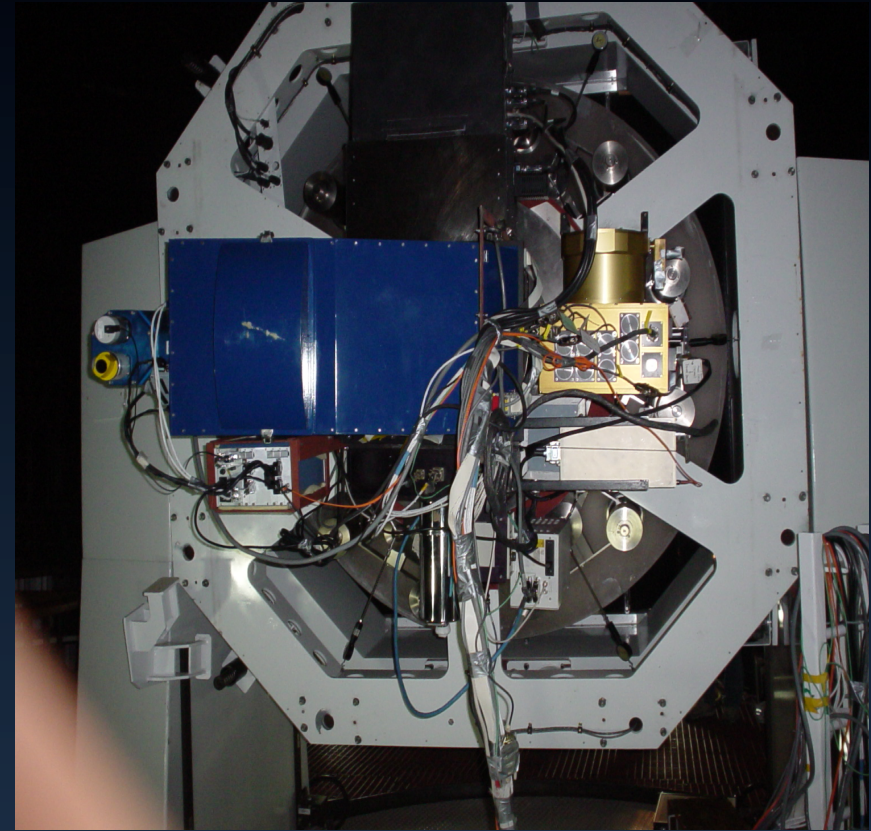
- Altitude: 4500m
(15000ft)
- ~ 260 clear nights / yr
- Median seeing: 0.9-1.0"
- Precipitable water vapour
 $< 2\text{mm}$
- Useful nights throughout
the year
- Controlled from IIA
Bangalore

http://www.iiap.res.in/iao_telescope



Himalayan Chandra Telescope

- Spectroscopy:
 - » $R \approx 150 - 4500$
- Optical imaging:
 - » Broad / narrow band filters
 - » FOV1: $10' \times 10'$ @ $0.297''/\text{px}$
 - » FOV2: $5.9' \times 11.8'$ @ $0.17''/\text{px}$
- Near-infrared imager
 - » JHK bands
 - » FOV: $1.8' \times 1.8'$; $3.6' \times 3.6'$



Instruments mounted on an instrument cube and available all the time.

http://www.iiap.res.in/iao_telescope

IUCAA Girawali Observatory (IGO)

2m Imaging + Spectroscopic
telescope

IUCAA Girawali Observatory

- Median seeing: 1.5"
- ~180 nights/year
 - » 90 photometric
 - » 140 spectroscopic
 - » Closed in Jul-Oct



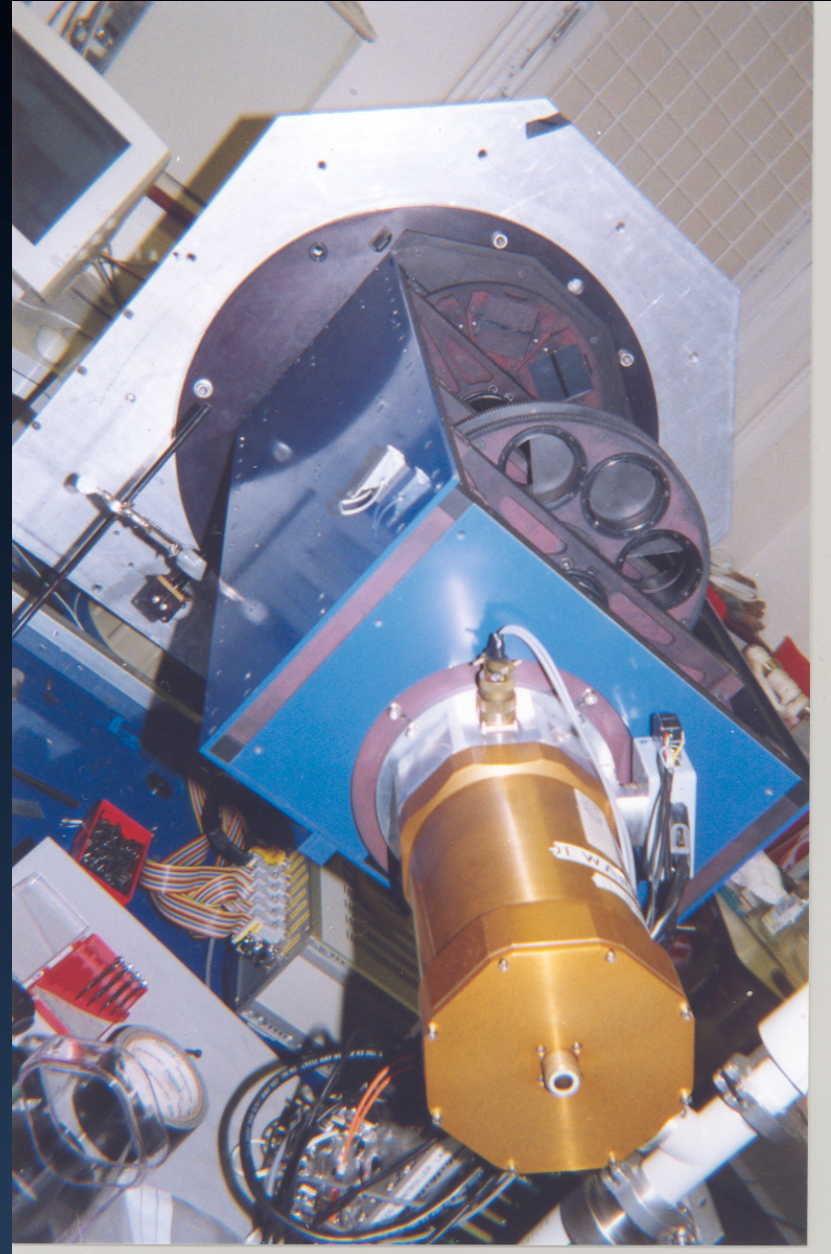
Instruments mounted on an instrument cube
and available all the time.

http://www.iucaa.ernet.in/~itp/igoweb/igo_in_out_observatory.htm



iFOSC

- Imaging:
 - » BVRI, upto 21 mag
- Spectroscopy:
 - » 330nm – 900nm
 - » $R \approx 1000 - 4000$
- Used for follow-ups to various transients



Southern African Large Telescope

10m telescope in South Africa

Standard suite of instruments

IUCAA: 10% partner



3.6 m Devasthal Optical Telescope

First proposals submitted!

Dome construction
image from March 2014



Capabilities:

- Basic statistics:
 - » F/9 Cassegrain focus
 - » 30' Field of view
 - » Active mirror
 - » 0.45" spot size
- Built in partnership with Belgium (~10%)
- First observing started
 - » 33% ARIES, 7% Belgium, 60% open Indian
- Primary instruments:
 - » 4k imager, ADFOSC, TIFR-TIRCAM2



Planned Instruments

- Optical Imager
- Faint object spectrograph and camera (FOSC)
 - » 14' FOV imager
 - » $R = 250 - 2000$ longslit spectroscopy
- Near Infrared Spectrograph (NIRS):
 - » 0.5 – 2.5 micron with H2RG detector
 - » $R = 100, 2000$
- High resolution spectrograph
- Deployable IFU spectrograph



Devasthal Fast Optical Telescope (DFOT)

1.3m Wide Field Imaging telescope

Devasthal Fast Optical Telescope

- Altitude: 2450m
- Median seeing 1.1"
 - » Much better due to raised dome
- Current camera:
 - » BVR, H α imaging
 - » 0.5" pixels, 18' FOV

arXiv:1304.2474



1.2m IR Telescope – Mt. Abu (PRL)



1.2m IR Telescope – Mt. Abu (PRL)

- Altitude: 1700 m
- Seeing: $\sim 1.5''$
- ~ 220 nights/year, ~ 150 photometric
- Main instrument: NICMOS + NICS
- Near IR camera + spectrograph



Giant Meterwave Radio Telescope



GMRT

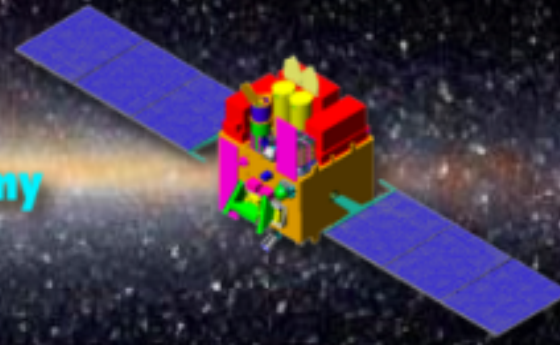
- 30 dishes of 45 m diameter each
- Five bands: 150, 235, 325, 610, 1000-1420 MHz
 - » Upgrade under way to cover complete range from 250 – 1420 MHz
- Y-shaped array + central square
 - » Sensitivity at many angular scales
- Individual dish field of view ~ 1 sq. deg



ASTROSAT

A Satellite Mission for Multi-wavelength Astronomy

Indian Space Research Organisation



ASTROSAT

A multi-wavelength satellite



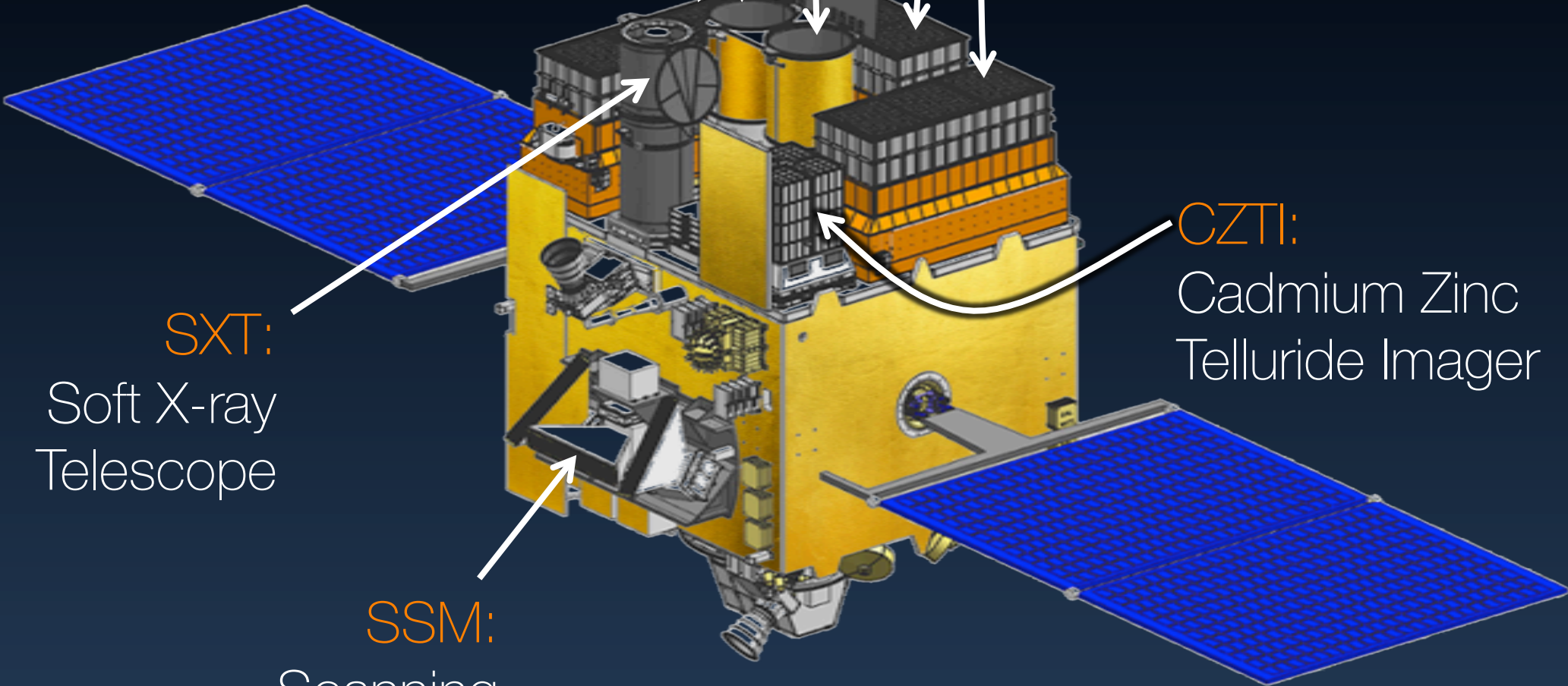
UVIT:
Ultra Violet
Imaging
Telescope

LAXPC:
Large Area X-ray
Proportional Counter

CZTI:
Cadmium Zinc
Telluride Imager

SXT:
Soft X-ray
Telescope

SSM:
Scanning
Sky Monitor



CZTI: Coded mask + 128^2 CZT

LAXPC: Collimator + PC

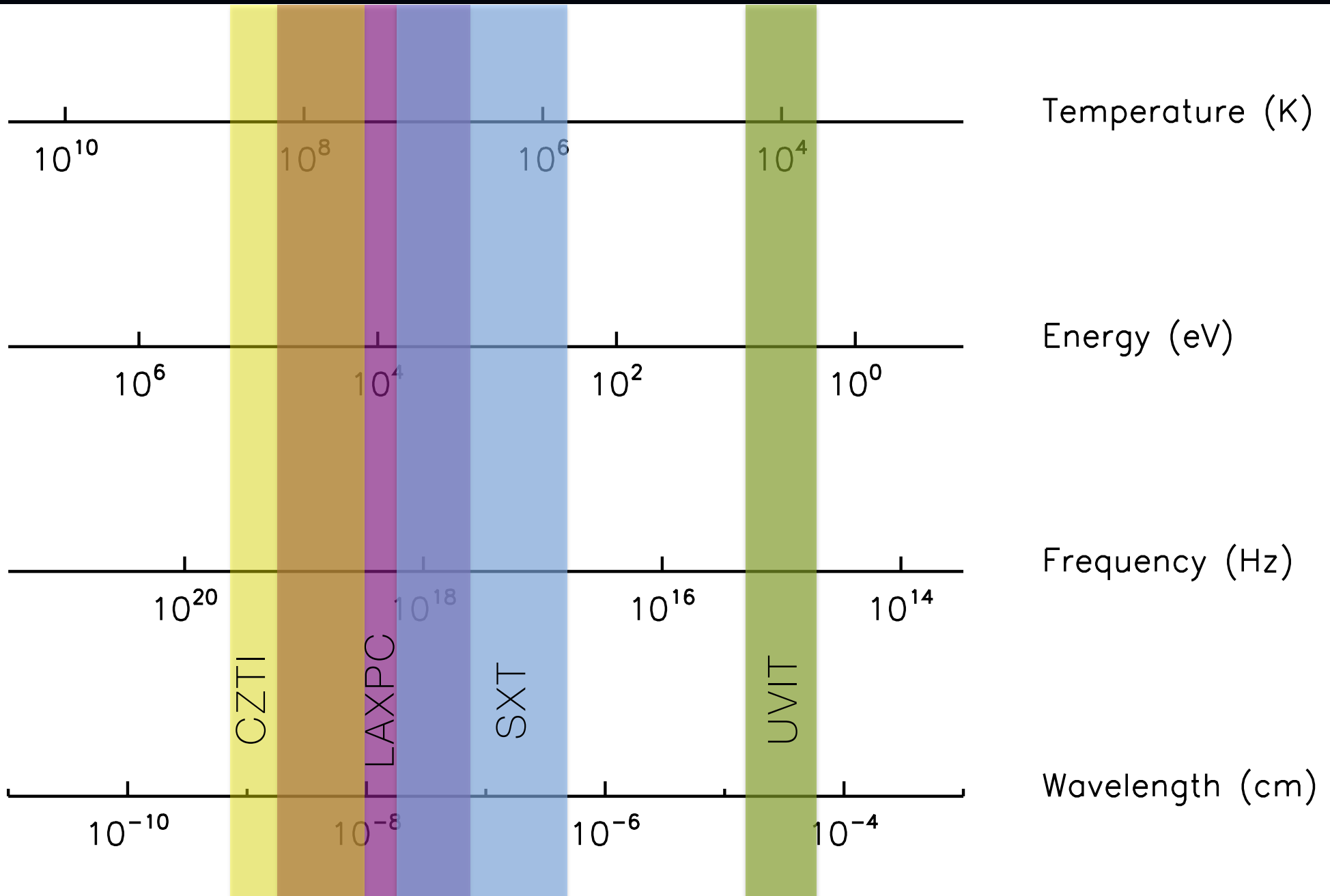
UVIT: MCP +
 512^2 CMOS



SXT:
Foil mirrors
+ 600^2 CCD

1 deg

Spectral coverage



Large Indian Telescopes

