

46th Session of UN COPUOS STSC February 11, 2009

K. Radhakrishnan,
India



CHANDRAYAAN – 1

India's first Lunar mission

त्वं सोम प्र चिकितो मानीषा ।

त्वं रजिष्ठ मनु नोषि पञ्चाम ॥

O Moon! We should be able to know
you through our intellect; You
enlighten us through the right path.

Rig Veda Part – I/91/1

Chandrayaan-the Indian initiative for Exploration Moon



Elaborate process of national consultation during May 1999 to April 2003



Prime Minister of India announced on August 15, 2003 on the nation's decision to enter into a new era of planetary exploration

Chandrayaan-the Scientific Objectives

Understanding the origin and Evolution of the Moon

Physical Properties of the Moon

Topography

Gravity

Magnetic Field

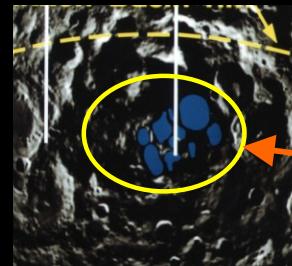
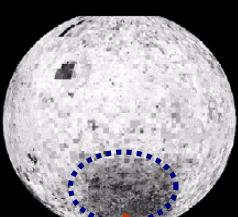
Radiation Environment



The bulk chemistry of Moon

Nature of the Lunar Crust

The Lunar Far-side:
Rock types, Chemistry

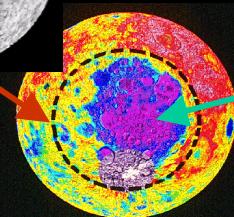


Special Regions of Interest:

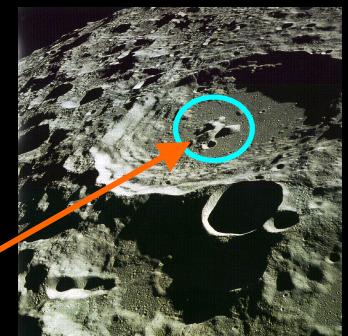
Polar Regions ,

South Pole Aitken Region,

Selected Basins and Craters with central uplift

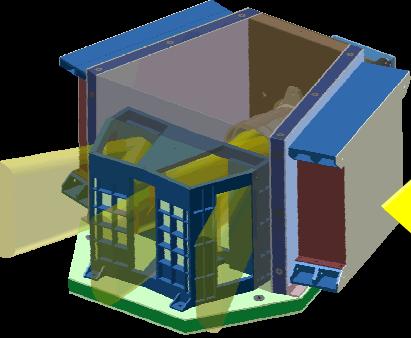
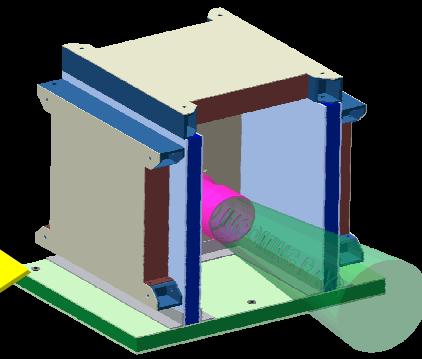
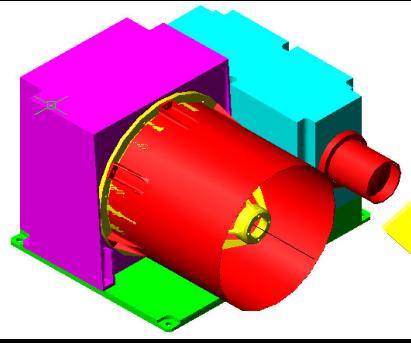
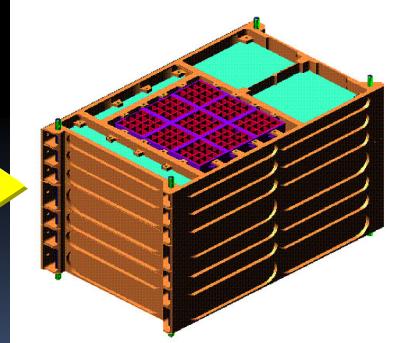
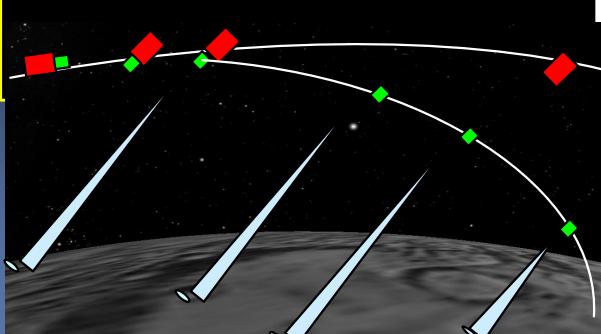


Nature of the Magma Ocean and Lunar Interior



Nature of Volatile Transport on Moon (Water on Moon?)

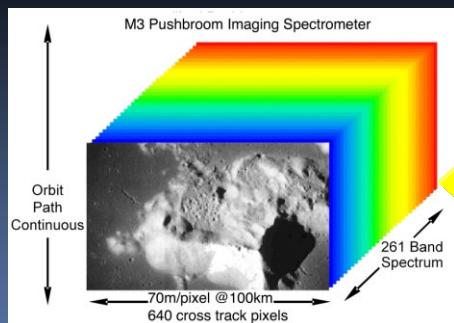
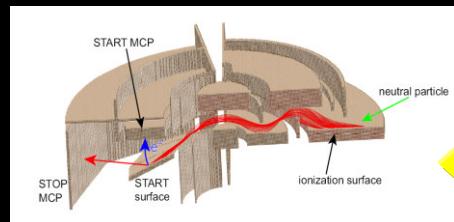
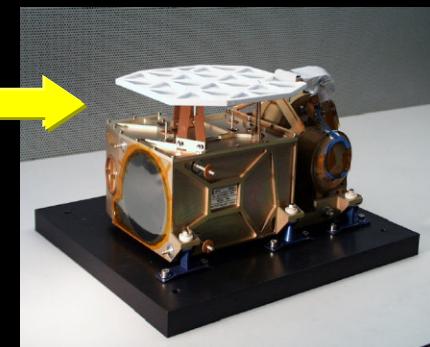
Main Scientific Payloads of Chandrayaan-1 Mission (being built by ISRO, TIFR, PRL)

	Terrain Mapping Stereo Camera	5 m spatial resolution	
	Hyper Spectral Imager	400-950nm band (15nm) spatial resolution of 80m	
	Lunar Laser Ranging Instrument	10 m height resolution	
	High Energy Spectrometer	20-250 keV energy region 40 km spatial resolution	
	Moon Impact Probe		

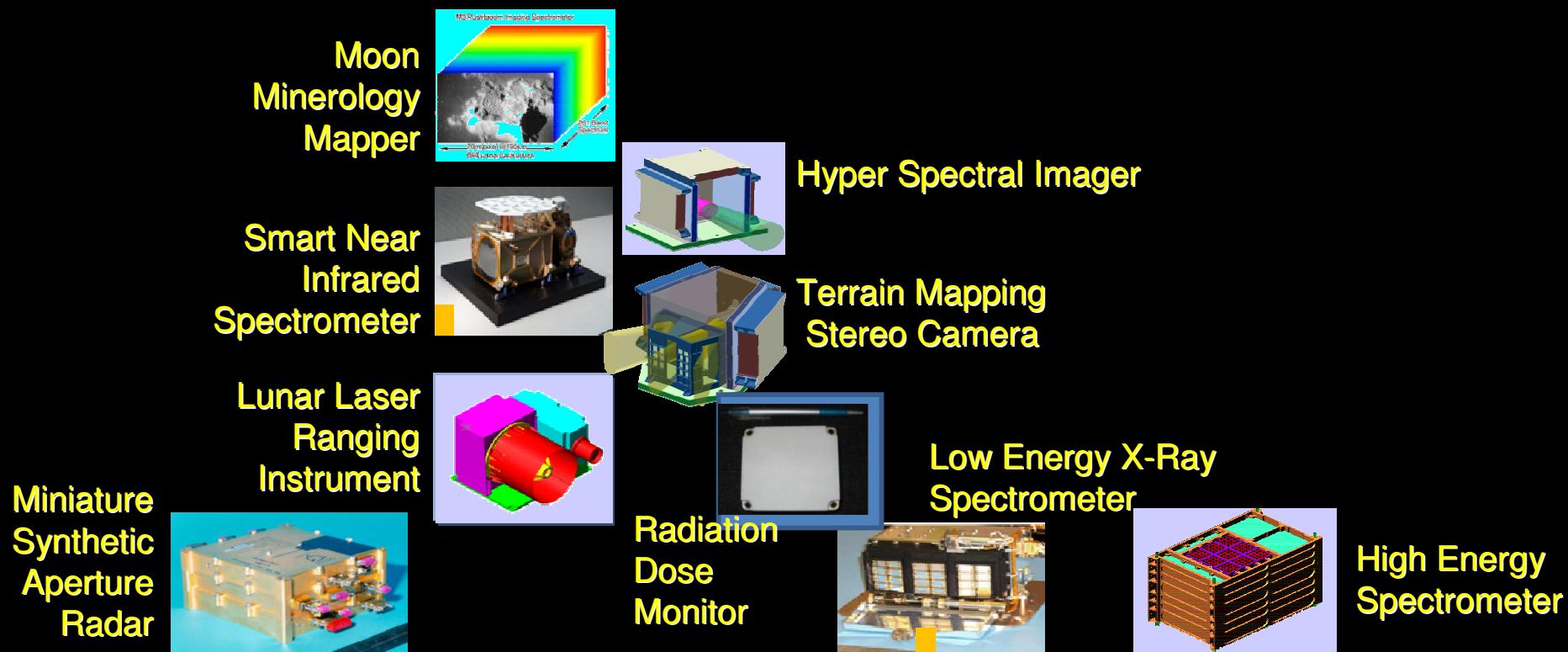
Scientific Payloads of Chandrayaan-1 Mission (from international scientific community)



Low Energy X-Ray Spectrometer (1-10 KeV)	ESA (UK) and ISRO
Smart Near Infrared Spectrometer	ESA (Germany)
Sub KeV Atom Reflecting Analyser	ESA (Sweden)
Miniature Synthetic Aperture Radar	NASA
Moon Mineralogy Mapper	NASA
Radiation Dose Monitor	Bulgaria



Chandrayaan: A Unique High Resolution Remote Sensing Mission



Radio

Microwave

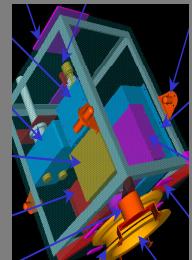
Infra-red

Visible

UV

X-rays

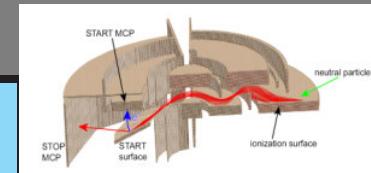
Gamma-rays



Moon Impact Probe

Sub KeV Atom Reflecting Analyser

Neutral particles



Assembly and Testing of Chandrayaan Spacecraft at ISAC, Bangalore



1994

PSLV- Launch Vehicle

2008

DEVELOPMENT



13 Successive Successful Flights

PAYOUT IMPROVEMENT PACKAGES

850 kg
(SSPO)

1600 kg
(SSPO)

1100 kg
(SSPO)

1750 kg
(SSPO)

OPERATIONAL PSLV

PSLV

PSLV
CORE ALONE



PSLV-C11 /Chandrayaan-1 (from Vehicle Assembly building to Launch Pad)

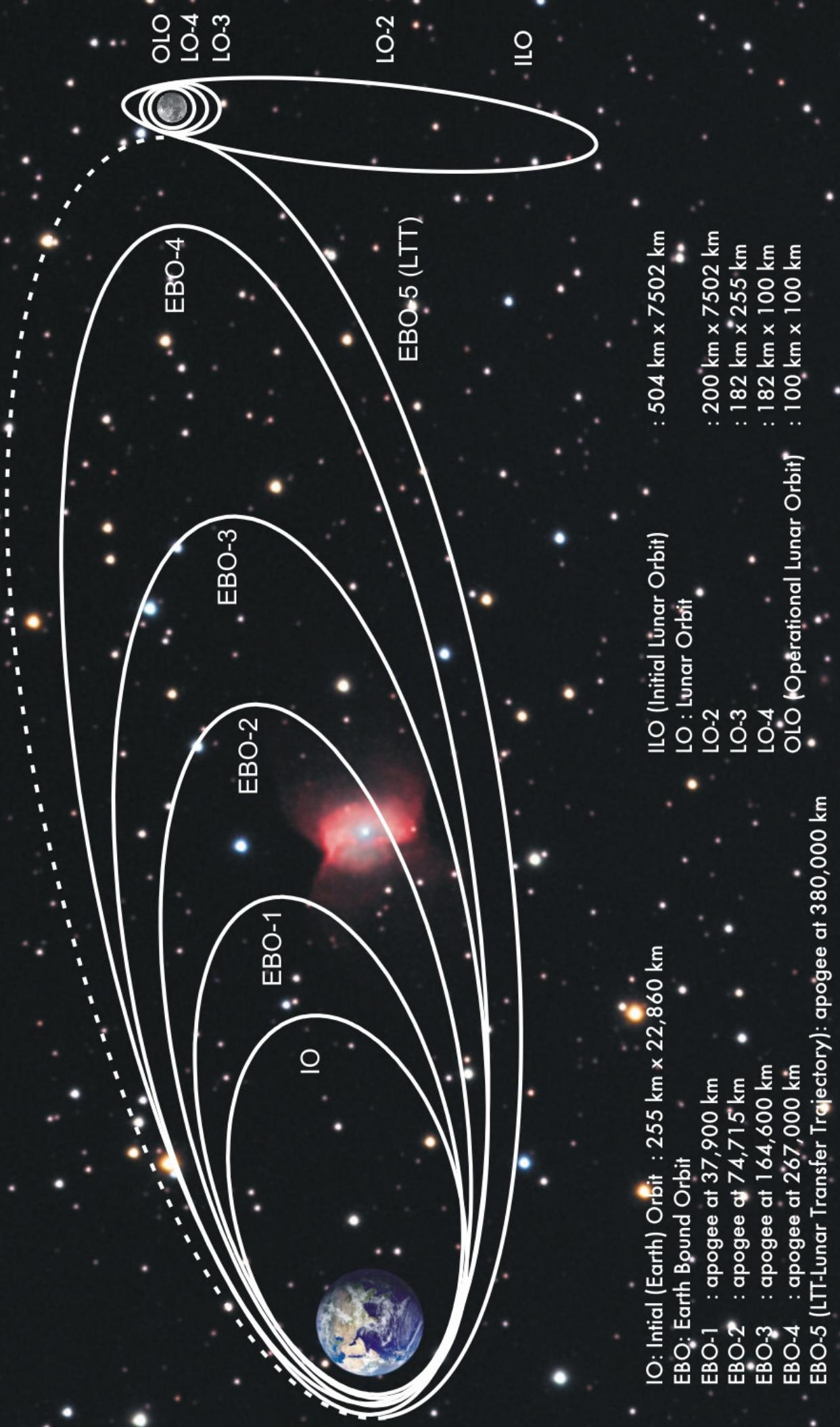


32 Metre Antenna System of Deep Space Network



A View of Mission Control Centre



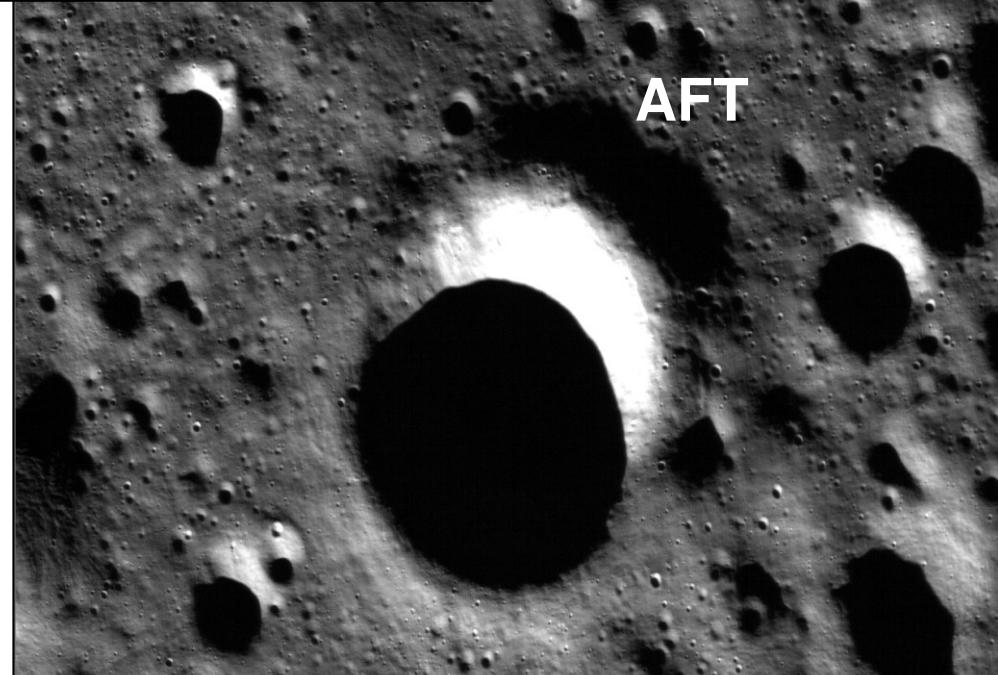
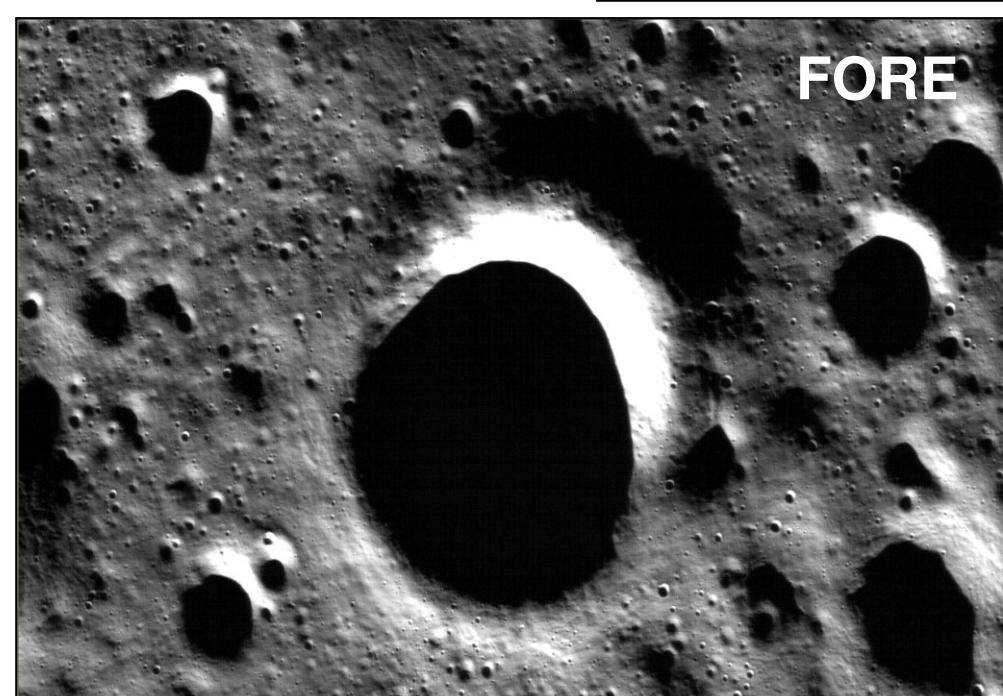
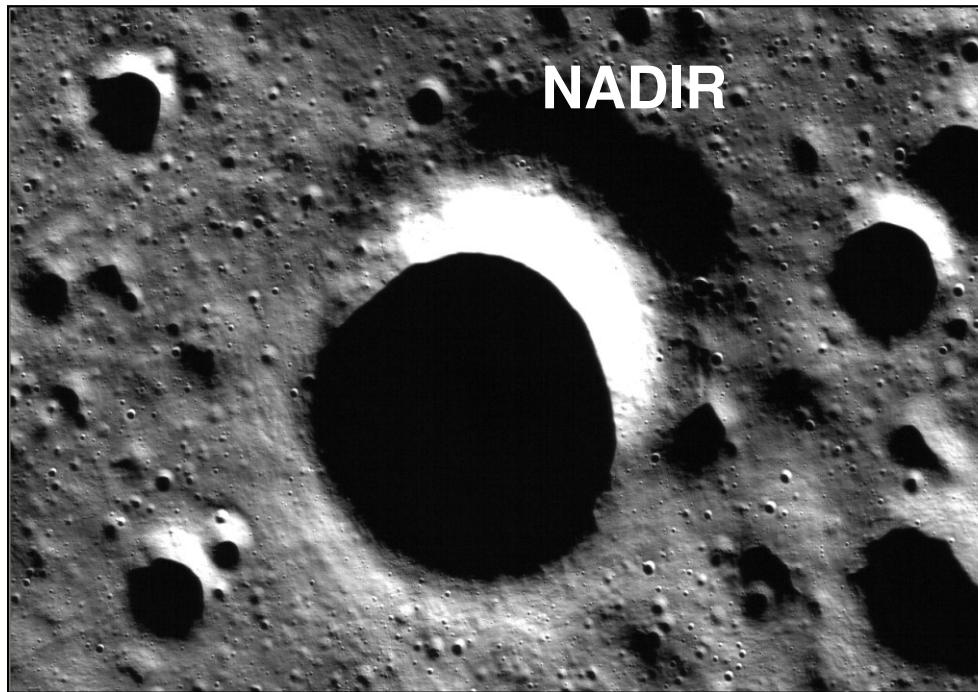


Chandrayaan Payload Commissioning

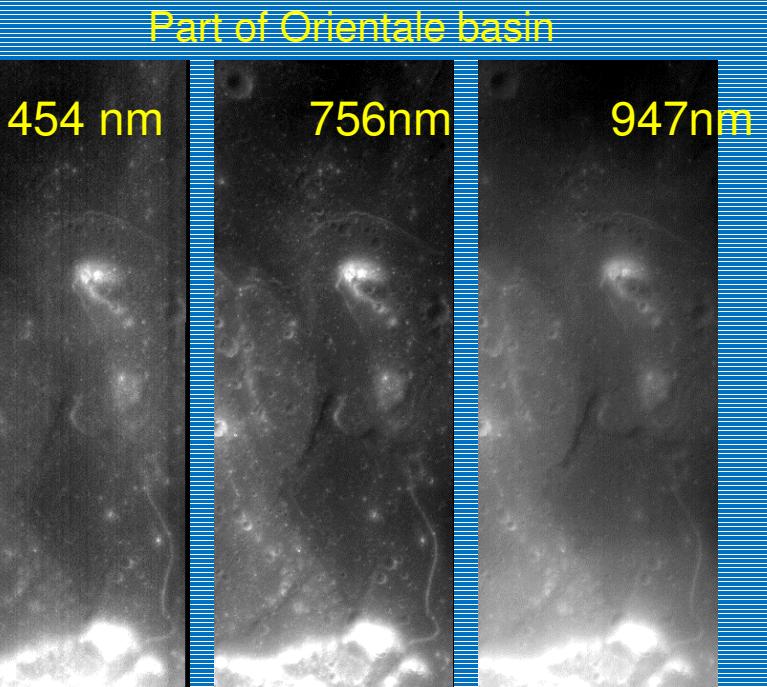
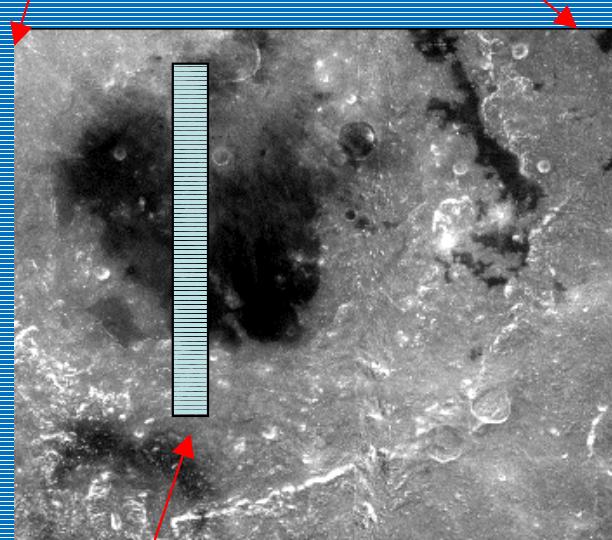
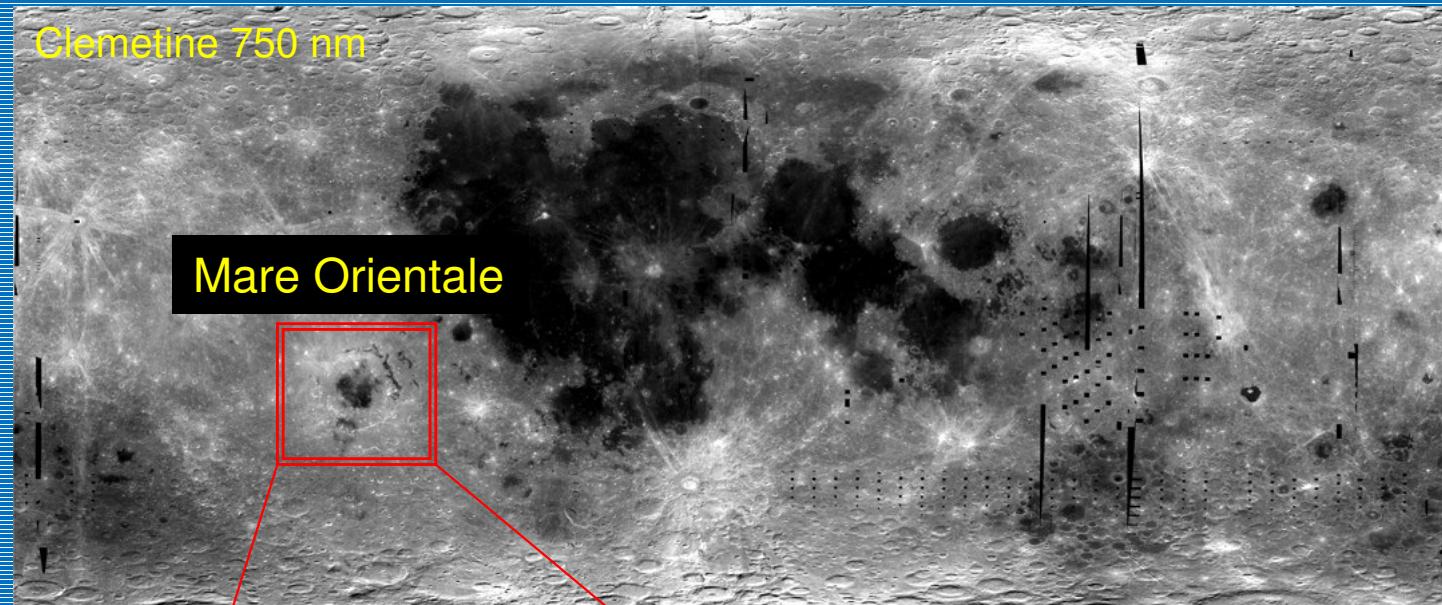
Payload	Date of Commissioning
Radiation Dose Monitor	22.10.08
Terrain Mapping Camera (TMC)	29.10.08
Moon Impact Probe (MIP)	14.11.08
Lunar Laser Ranging Instrument (LLRI)	16.11.08
Hyper Spectral Imaging Camera (HYSI)	16.11.08
Mini SAR	17.11.08
Moon Mineralogy Mapper (M3)	18.11.08
InfraRed Spectrometer (SIR-2)	19.11.08
Chandrayaan-1 X-ray Specrometer (C1XS)	20.11.08
High Energy X-ray (HEX)	05.12.08
Sub keV Atomic Reflecting Analyser (SARA)	08.12.08

CRATER MORPHOLOGY from

Chandrayaan-1 Terrain Mapping Camera (November 16, 2008)



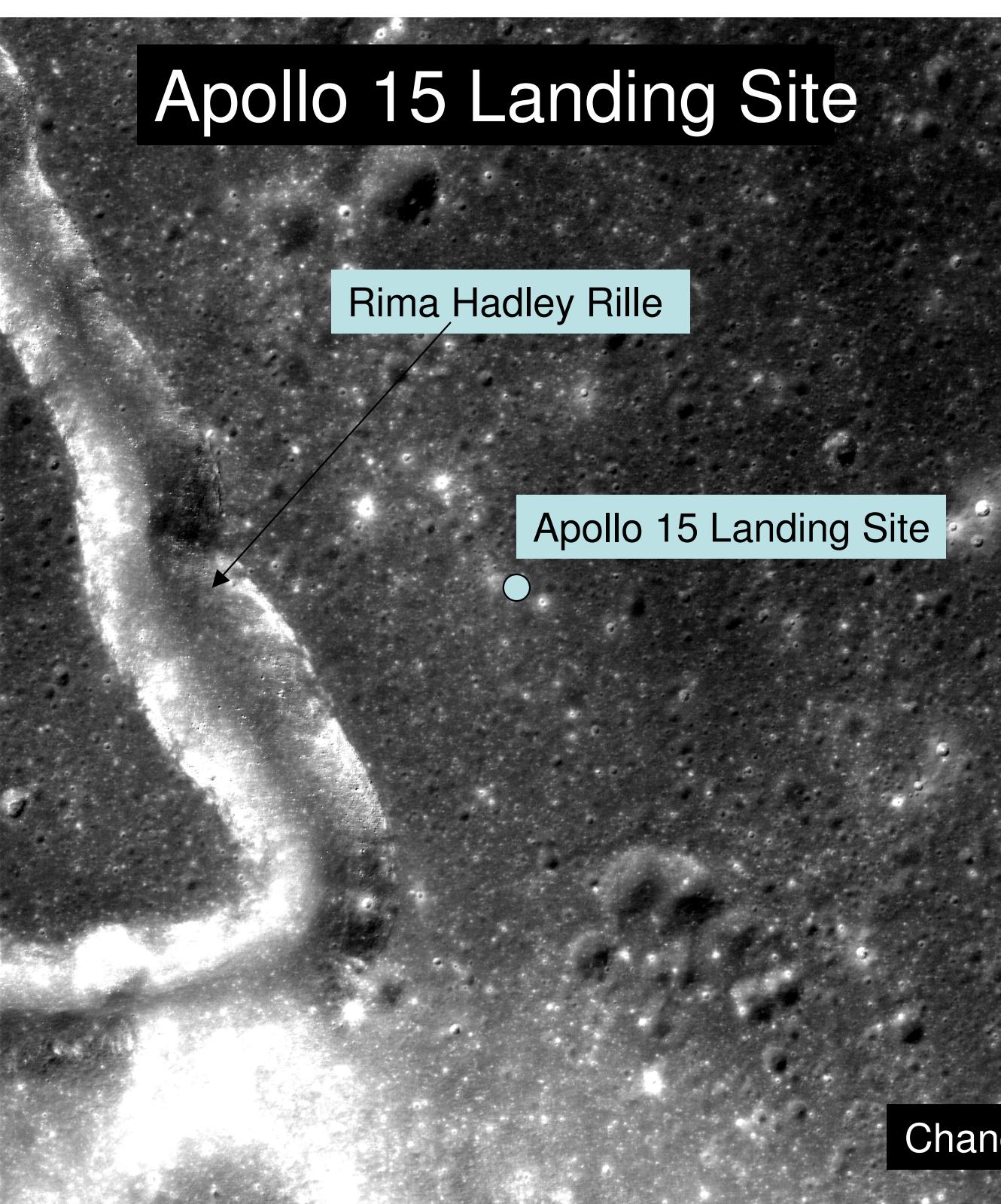
Analysis of Orientale Basin data : Chandrayaan-1 HySI



Chandrayaan-1 HySI bands

Apollo 15 Landing Site

Apollo 15 Tracks



Chandrayaan TMC data 9 Nov 2009

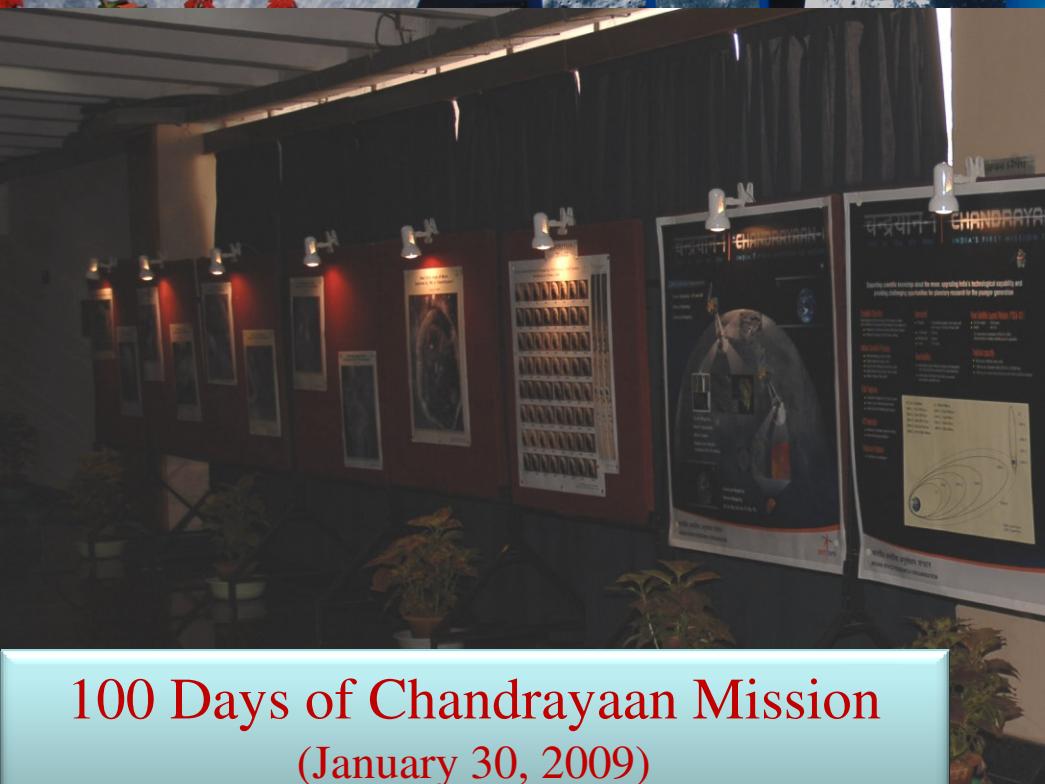
Chandrayaan-1 Science Team Members



ISRO SATELLITE CENTRE, Bangalore

Chandrayaan-1

India on Moon



100 Days of Chandrayaan Mission
(January 30, 2009)



Thank you for the kind attention