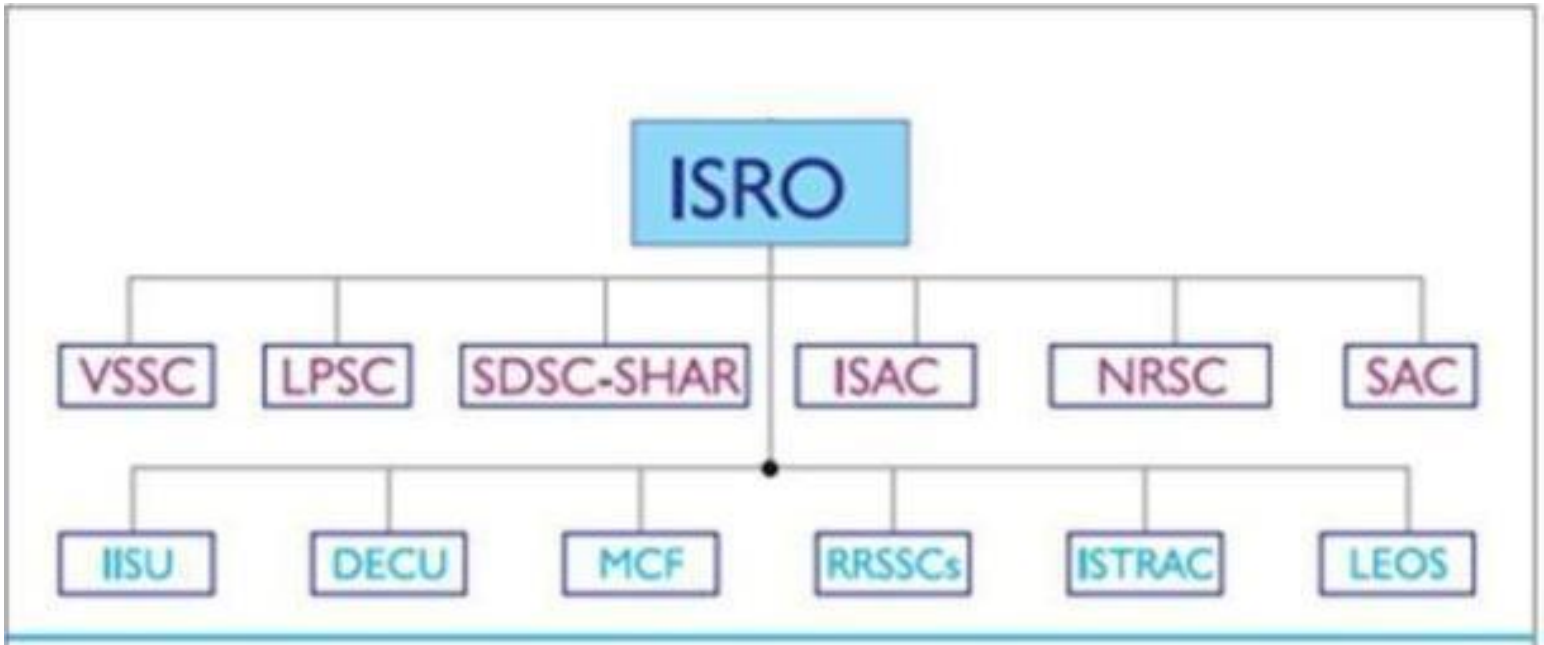
Agency's Report
(ISRO Science Data Archive)

B Gopala Krishna
Group Director, SPDCG/SIPA
Space Applications Centre (ISRO)
Ahmedabad, INDIA
bgk@sac.isro.gov.in

8th Meeting of IPDA Steering Committee
at CNES, Paris, July 16-18, 2013

Background on Agency (ISRO)

- The objective of ISRO is to develop space technology and its application to various national tasks. ISRO has established two major space systems, INSAT for communication, television broadcasting and meteorological services, and Indian Remote Sensing Satellites (IRS) system for resources monitoring and management. ISRO has developed two satellite launch vehicles, PSLV and GSLV, to place INSAT and IRS satellites in the required orbits



NRSC: National Remote Sensing Centre, **PRL:** Physical Research Laboratory, **NARL:** National Atmospheric Research Laboratory, **NE-SAC:** North Eastern Space Applications Centre, **SCL:** Semi-Conductor Laboratory, **ISRO:** Indian Space Research Organisation, **Antrix:** Antrix Corporation Limited, **VSSC:** Vikram Sarabhai Space Centre, **LPSC:** Liquid Propulsion Systems Centre, **SDSC:** Satish Dhawan Space Centre, **ISAC:** ISRO Satellite Centre, **SAC:** Space Applications Centre, **IISU:** ISRO Inertial Systems Unit, **DECU:** Development and Educational Communication Unit, **MCF:** Master Control Facility, **RRSSCs:** Regional Remote Sensing Service Centres, **ISTRAC:** ISRO Telemetry, Tracking and Command Network, **LEOS:** Laboratory for Electro-optic Systems, **IIST:** Indian Institute of Space Science and Technology

Space Applications Centre (SAC)

- **Space Applications Centre (SAC)** is one of the major centres of the ISRO that is engaged in the research, development and demonstration of applications of Space Technology in the field of Communications, Remote Sensing, Meteorology and Satellite Navigation. This includes R&D on onboard systems, ground systems and end user equipment hardware and software.
- It's achievements include development of communication and meteorological payloads for INSAT, Optical and Microwave payloads for IRS satellites.

Public Release Policy

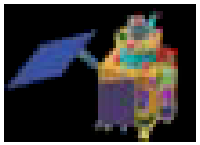
- Instrument data is released to public after a lock-in period during which time PI has all the rights of the data.
- Further, the data is to be peer reviewed (as per the guidelines provided in Archive Plan) and a Long Term Archive (LTA) prepared, before the release.

Status of archive effort and upcoming mission support

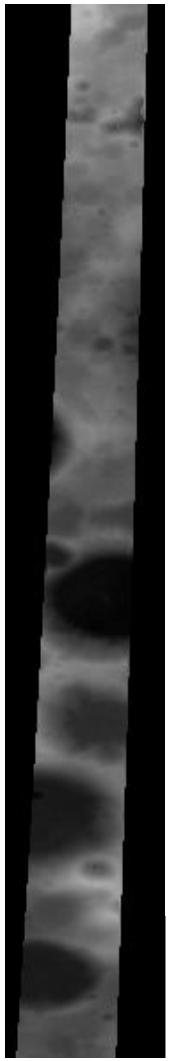
- Chandrayaan-1 (current)
- Mars Orbiter Mission (near future)
- Astrosat (future)
- Chandrayaan-2 (future)

Chandrayaan-1 Archive

- Chandrayaan-1 LTA for the following payloads are released on 19th April 2013 from ISSDC (http://www.issdc.gov.in/)
  - TMC
  - HySI
  - SARA
  - M3 and MiniSAR
- TMC Digital Elevation Model (Higher Level Products) for the possible passes and samples of Lunar mapsheets generated at Space Applications Center (SAC) are also released on the same day
- LTA for C1XS and SIR-2 instrument data is awaited from PI/archive teams



Ch-1 DEM Browse



Department Of Space

ISRO Science Data Archive(ISDA)

Govt. Of India,ISTRAC/ISSDC Bengaluru.

This is a preliminary release of TMC and HySI data sets Browse.

HOME ISSDC DISCLAIMER SITE MAP FEEDBACK CONTACT US LOGOUT

Welcome navita

CHANDRAYAAN-1
. Data Release
. Mission To moon
. Objective
. Mission Profile
. Payloads
. Launch Vehicles
. SpaceCraft
. Ground Segment
SEARCH (TMC & HYSI)
AO PAYLOADS SEARCH
DEM SEARCH
TMC NORTH POLE MOSAIC
TMC SOUTH POLE MOSAIC
TMC NORTH POLE DEM OVERLAY
TMC SOUTH POLE DEM OVERLAY
TMC MOSAIC (WITHOUT POLES)
HYSI NORTH POLE MOSAIC NEW !
HYSI SOUTH POLE MOSAIC NEW !
GLOBE VIEW OF TMC MOSAIC **
GLOBE VIEW OF TMC DEM NEW !
GLOBE VIEW OF HYSI FIRST SEASON **
GLOBE VIEW OF M3 FIRST SEASON **
**DOWNLOADS
REQUEST STATUS
M3 Data Volumes

SEARCH RESULTS FOR
PAYLOAD_NAME: TMC_DEM

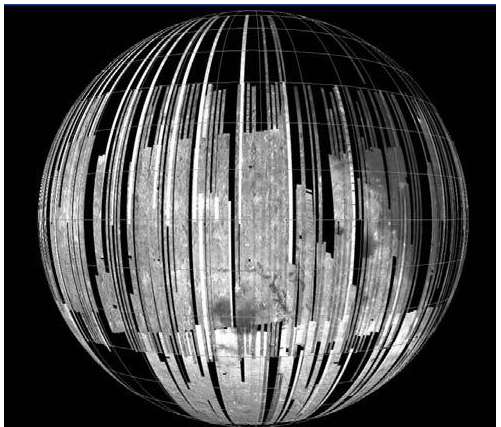
BROWSE IMAGE	DEM_PRODUCT_ID	PDS_PRODUCT_ID	ORBIT_NO	DATE_OF_PASS	METADATA	FILE SIZE ↓	ORTHO_FILE SIZE	REQUEST DATA
	TMC_NRD_20090608T025010_1_AN	TMC_NRN_20090608T025010517	2553	2009-06-08	METADATA	96MB	2.5GB	
	TMC_NRD_20090607T214727_1_AN	TMC_NRN_20090607T214727169	2551	2009-06-07	METADATA	96MB	2.3GB	
	TMC_NRD_20090605T044008_1_AN	TMC_NRN_20090605T044008656	2520	2009-06-05	METADATA	91MB	2.3GB	
	TMC_NRD_20090620T143639_1_AN	TMC_NRN_20090620T143639951	2694	2009-06-20	METADATA	70MB	1.7GB	
	TMC_NRD_20090621T202109_1_AN	TMC_NRN_20090621T202109027	2708	2009-06-21	METADATA	69MB	1.3GB	
	TMC_NRD_20090528T113440_1_AN	TMC_NRN_20090528T113440118	2433	2009-05-28	METADATA	66MB	2.9GB	
	TMC_NRD_20090612T183820_1_AN	TMC_NRN_20090612T183820052	2606	2009-06-12	METADATA	65MB	1.6GB	
	TMC_NRD_20090512T063025_1_AN	TMC_NRN_20090512T063025594	2243	2009-05-12	METADATA	63MB	1.6GB	
	TMC_NRD_20090630T041800_1_AN	TMC_NRN_20090630T041800444	2802	2009-06-30	METADATA	61MB	1.2GB	
	TMC_NRD_20090602T053930_1_AN	TMC_NRN_20090602T053930510	2487	2009-06-02	METADATA	60MB	1.3GB	
	TMC_NRD_20090621T160608_1_AN	TMC_NRN_20090621T160608614	2706	2009-06-21	METADATA	59MB	1.1GB	
	TMC_NRD_20090618T113530_1_AN	TMC_NRN_20090618T113530163	2670	2009-06-18	METADATA	58MB	1.3GB	
	TMC_NRD_20090615T091150_1_AN	TMC_NRN_20090615T091150394	2635	2009-06-15	METADATA	54MB	1.9GB	
	TMC_NRD_20090605T184038_1_AN	TMC_NRN_20090605T184038652	2527	2009-06-05	METADATA	54MB	1.3GB	
	TMC_NRD_20090604T170900_1_AN	TMC_NRN_20090604T170900133	2515	2009-06-04	METADATA	54MB	1.4GB	
	TMC_NRD_20090612T142310_1_AN	TMC_NRN_20090612T142310433	2604	2009-06-12	METADATA	51MB	1.3GB	
	TMC_NRD_20090605T085528_1_AN	TMC_NRN_20090605T085528532	2522	2009-06-05	METADATA	51MB	1.3GB	
	TMC_NRD_20090613T072410_1_AN	TMC_NRN_20090613T072410438	2612	2009-06-13	METADATA	48MB	1.1GB	
	TMC_NRD_20090530T210525_1_AN	TMC_NRN_20090530T210525210	2460	2009-05-30	METADATA	48MB	1.3GB	
	TMC_NRD_20090530T102625_1_AN	TMC_NRN_20090530T102625285	2455	2009-05-30	METADATA	48MB	1.2GB	
	TMC_NRD_20090614T002430_1_AN	TMC_NRN_20090614T002430514	2620	2009-06-14	METADATA	472MB	11GB	
	TMC_NRD_20090615T144100_1_AN	TMC_NRN_20090615T144100167	2638	2009-06-15	METADATA	463MB	3.5GB	
	TMC_NRD_20090621T172008_1_AN	TMC_NRN_20090621T172008780	2707	2009-06-21	METADATA	45MB	810MB	
	TMC_NRD_20090629T102325_1_AN	TMC_NRN_20090629T102325436	2794	2009-06-29	METADATA	42MB	757MB	

Mozilla Firefox

http://localhost:8084/CHBrowse/3Dimages/LDEM/html/TMC_NRD_20090608T025010_1_AN.html

DEM_PRODUCT_ID	TMC_NRD_20090608T025010_1_AN
PDS_PRODUCT_ID	TMC_NRN_20090608T025010517
SENSORID	TMC
DATEOFPASS	2009-06-08 00:00:00.0
ORBIT	2553
CAMERA_COMBINATION	AN
SEGMENT_NUMBER	1_1
RECORD_TYPE	FIXED_LENGTH
RECORD_BYTES	2458
LINE_SAMPLES	16867
SAMPLE_TYPE	SIGNED
SAMPLE_BITS	16
MINIMUM_HEIGHT	211
MAXIMUM_HEIGHT	1679
RESOLUTION_X_DIRECTION	0
RESOLUTION_Y_DIRECTION	0
TOP_LEFT_LATITUDE	75.49
TOP_LEFT_LONGITUDE	3.59
TOP_RIGHT_LATITUDE	75.48
TOP_RIGHT_LONGITUDE	8.97
BOTTOM_LEFT_LATITUDE	61.66
BOTTOM_LEFT_LONGITUDE	3.71
BOTTOM_RIGHT_LATITUDE	61.62
BOTTOM_RIGHT_LONGITUDE	9.11
MAP_PROJECTION_TYPE	SELENOGRAPHIC
SPHEROID_NAME	MOON
FIRST_STANDARD_PARALLEL	N/A
SECOND_STANDARD_PARALLEL	N/A
POSITIVE_LONGITUDE_DIRECTION	EAST
CENTER_LATITUDE	N/A
CENTER_LONGITUDE	N/A
LONGITUDE_BELOW_POLE_OF_MAP	N/A
LATITUDE_OF_TRUE_SCALE	90 N
DATUM	1737.4 KM
COORDINATE_SYSTEM_NAME	MEAN EARTH/POLAR AXIS OF DE421
FALSE_EASTING	N/A
FALSE_NORTHING	N/A
ELEVATION_OFFSET	N/A
MEASUREMENT_UNIT	DD
TERRAIN_TYPE	moderate
QUALITY_REMARKS	null
SOFTWARE_USED	LMS
IMAGE_NAME	TMC_NRN_20090608T025010_DEM_SEG1_1_an.JPG
POSITION_FLAG	NORTH POLE
MODEL_ERROR_LAT	
MODEL_ERROR_LONG	
MODEL_ERROR_HEIGHT	
ORIGINAL_FILE	ch1_tmc_20090608_I02548_D02553_025010_seg1_NA_dem.tif
ORTHO_AVAILABLE	Y
POLAR	Y

Done

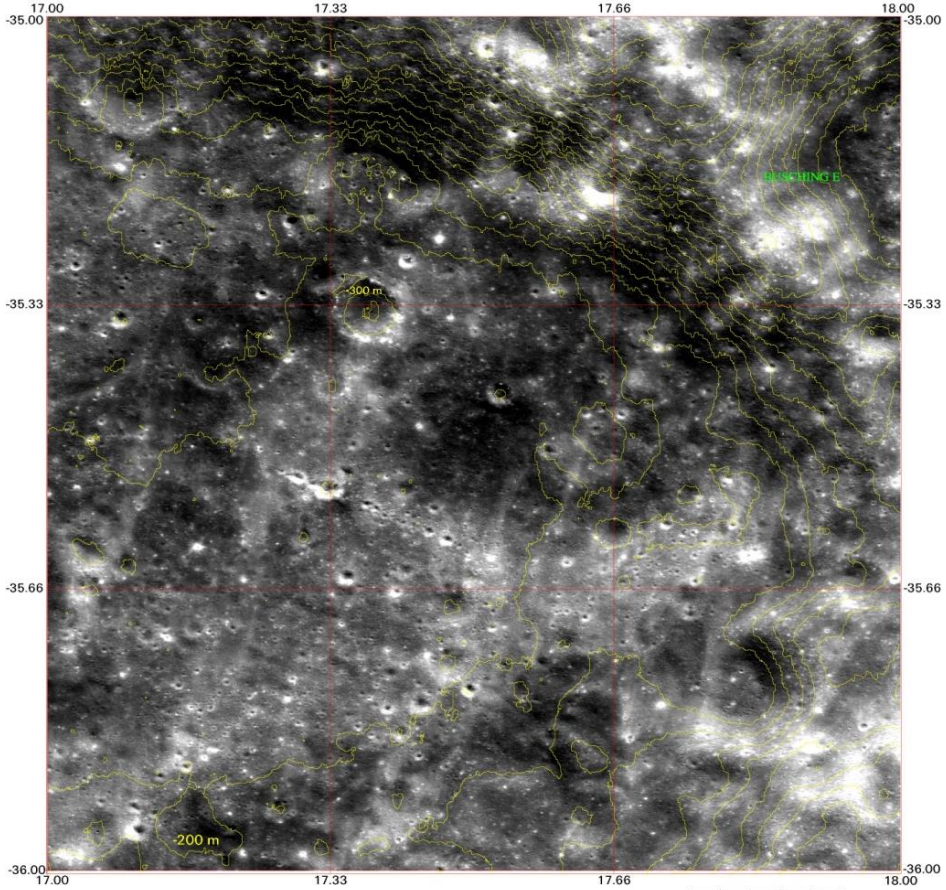


TMC globe view

CHANDRAYAAN-1 LUNAR TOPO ORTHOIMAGE MAP

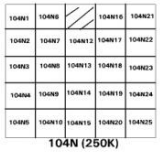
BUSCHING E

Edition 1 Sheet No.: 104N11



Scale

0 Contour Interval: 100 m 10 KM



104N (250K)

Image Information
Data Source: Chandrayaan-1 TMC
Sensor: Nadir
Orbit No.: 2848 & 2847
Date of Acquisition: 04 July 2009
Level of Correction: Orthorectified
Projection: Selenographic
Datum: Mean Radius of Moon
Date of Map Production:14 Aug 2012

Generating Agency: Satellite Photogrammetry and Digital Cartography Group
Signal & Image Processing Area; Space Applications Centre, Ahmedabad

INDIAN SPACE RESEARCH ORGANISATION
CHANDRAYAAN-1 TOPO ORTHOIMAGE MAP

EDITION 1 SHEET No. 104N11

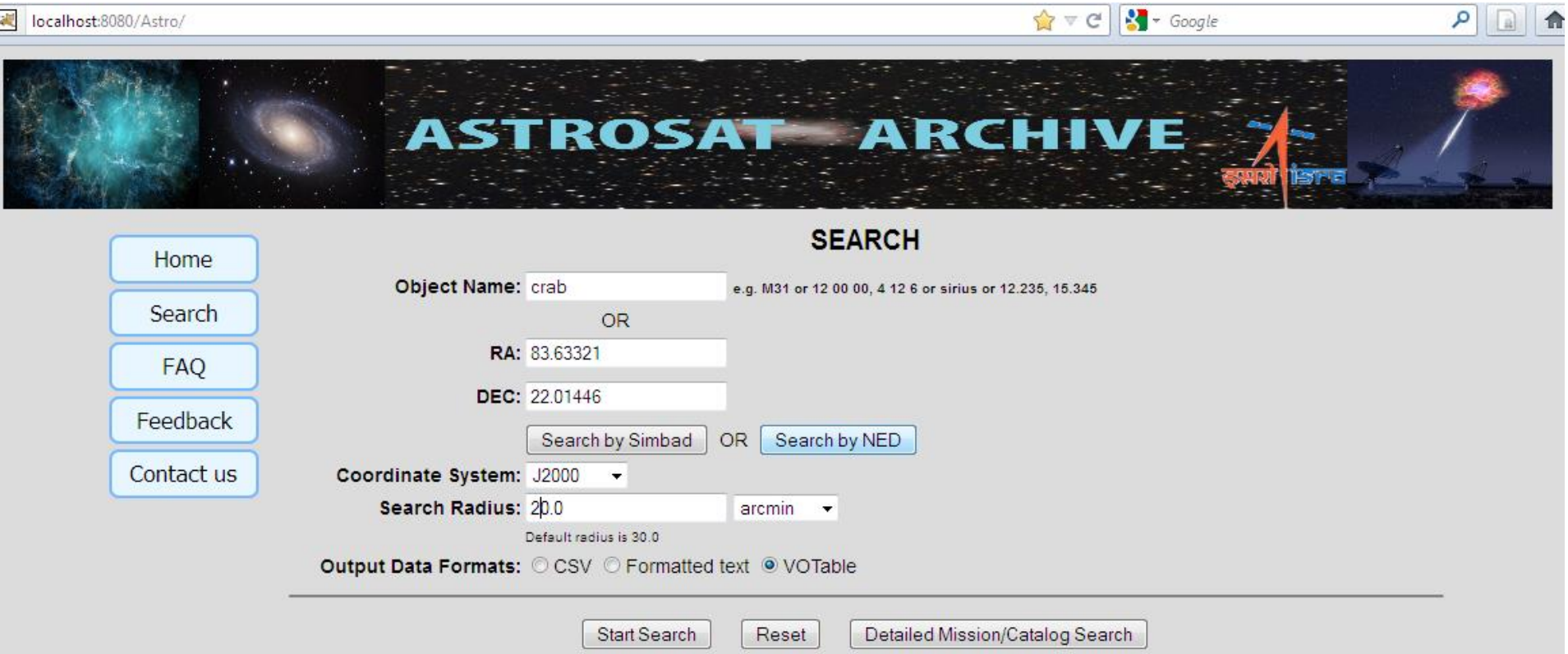
Mars Orbiter Mission (MOM)

- Expected launch in October 2013
- Carries five payloads
  - Mars Color Camera (MCC) to map various morphological features on Mars with optical imaging
  - Methane Sensor for Mars (MSM) to detect the presence of methane in the Martian atmosphere
  - Thermal Infrared Imaging Spectrometer (TIS) to map surface composition & mineralogy
  - Mars Exospheric Neutral Composition Analyser (MENCA) to study the neutral composition of the Martian upper atmosphere
  - Lyman Alpha Photometer (LAP) to investigate the escape processes of Mars upper atmosphere through Deuterium/Hydrogen
- Data archive planned to be in PDS

Astrosat

- India's first dedicated astronomical satellite, expected to be launched during second quarter of 2014.
- For study of cosmic sources, using multi-wavelength/ Broad band X-ray studies (Spectra, Variability) UV to X-rays
- Five payloads: UVIT, CZTI, SXT, LAXPC and SSM
- Datasets to be archived in FITS Format
- Two processing levels (Level-1 and Level-2) are identified for all instruments of Astrosat for archival at ISSDC
- Software development for Astrosat data products generation is completed and it is ongoing for archive and dissemination
- Astrosat Archive is planned to be VO Compliant

Conical Search



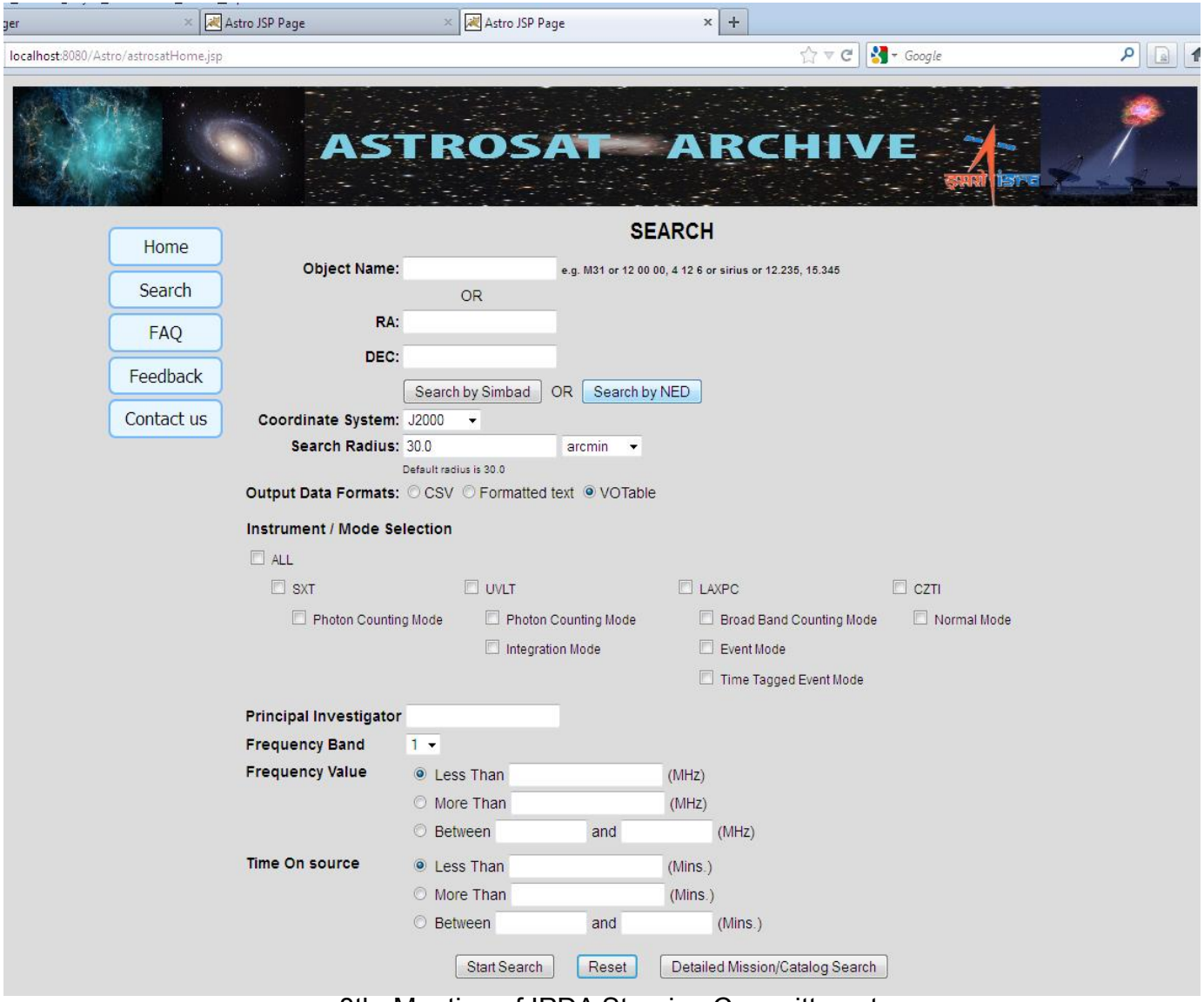

```
+-----+------------------+------------------+
| id  | ra               | decl             |
+-----+------------------+------------------+
| M35 | 92.2249999046326 | 24.3333333333333 |
| M36 | 84.0249996185303 | 34.1333333333333 |
| M37 | 88.1000003814697 | 32.55            |
| M38 | 82.1750001907349 | 35.8333333333333 |
+-----+------------------+------------------+
```

Formatted Text

```
id,ra,decl
M35,92.2249999046326,24.3333333333333
M36,84.0249996185303,34.1333333333333
M37,88.1000003814697,32.55
M38,82.1750001907349,35.8333333333333
M42,83.8500003814697,-5.45
M43,83.8999996185303,-5.26666666666667
M78,86.6750001907349,0.05
```

CSV Format

Advanced Search Page



Chandrayaan-2

- Configured as a two module system comprising of an Orbiter Craft module (OC) and a Lander Craft module (LC) carrying the Rover.
- Orbiter carries five payloads
  - Imaging IR Spectrometer (IIRS) for mineral mapping
  - TMC-2 for topographic mapping
  - MiniSAR to detect water ice in the permanently shadowed regions on the Lunar poles, up to a depth of a few meters
  - Large Area Soft X-ray spectrometer (CLASS) & Solar X-ray Monitor (XAM) for mapping the major elements present on the lunar surface
  - Neutral Mass Spectrometer (ChACE2) to carry out a detailed study of the lunar exosphere towards moon exploration

Chandrayaan-2

- The Lander Craft with scientific payloads will soft land on the lunar surface at a predetermined location on the lunar surface
- The Rover will be released by the Lander Craft and has the mission objective of performing mobility activities on low gravity and vacuum of Moon surface with Semi-Autonomous navigation and hazard avoidance capability.
- The Laser Induced Breakdown Spectroscope (LIBS) and Alpha Particle X-Ray Spectrometer (APXS) payloads onboard Rover would perform elemental analysis of the lunar surface near the landing site.
- Data archive for MOM is planned to be in PDS

Plans for using PDS4

- Initially we want to start with PDS3 for MOM and slowly migrate to PDS4 after gaining experience
- This experience to be used for Ch-2 for PDS4 implementation from the beginning

Tools needed

- TBD for PDS4 start up for the new projects

Needs from IPDA Steering Committee

- Availability of sample data sets from other missions who has already in compliance with PDS4 standards, for the new implementation as an example
- Help or consultancy for starting a new project in PDS4; to start with MOM data

Thank You

8th Meeting of IPDA Steering Committee at
CNES, Paris, July 16-18, 2013