

Sharp-eyed Cartosat-3 to take to the skies today

PSLV-C47 will carry the earth observation satellite and 13 small ones

MADHUMATHI D.S.
BENGALURU

Advanced earth observation satellite Cartosat-3, which is due to be launched from the Satish Dhawan Space Centre SHAR at Sriharikota in coastal Andhra Pradesh on Wednesday morning, will have the 'sharpest eye' of civil remote sensing satellites in the world.

It will be carried by PSLV-C47. Thirteen small satellites of two U.S. customers will be the secondary payloads.

A 26-hour countdown began for the launch on Tuesday morning.

One of Cartosat-3's cameras offers a ground resolution of 25 cm — this means it can pick up an object of a minimum of that size from a

height of around 500 km. Currently, WorldView-3, a satellite owned by U.S. company Maxar, has the best ground resolution of 31 cm.

So far, the Indian Space Research Organisation (ISRO) has orbited eight Cartosat-2 series — 2C, 2D, 2E and 2F. However, an existing policy allows only government and government authorised agencies to access ISRO's

The previous best view from a Cartosat was 65 cm, as put in the last three or four satellites in the Cartosat-2 series. Data from most of them, especially the last four Carto-2 series ones, launched in relatively quick succession in the past three years, are exclusively used by the armed forces.

Mapping the earth

Cartosat-3 is a third generation earth observation satellite with high resolution imaging capability. A look at some of its features



A view of Cartosat-3 at the Assembly Complex at Sriharikota. • PTI

Uses: Large scale urban planning, rural resource and infrastructure development, coastal land use and land cover

Overall mass: 1,625 kg

Mission life: 5 years

Minute details: The satellite will be able to see objects that are just **25 cm** from its orbital perch around 500 km away

• The previous best view from a Cartosat was 65 cm

• Only government or government authorised agencies can access images below a resolution of 1 m

high-resolution imageries below a resolution of 1 m.

At 1,625 kg, Cartosat-3 is unusually heavy and more than double the mass of the previous eight in its class. Many new technologies have

been built in, such as a highly agile or flexible camera; high-speed data transmission, advanced computer system and new power electronics, according to the website Space Skyrocket.

Most advanced satellite developed in India: Sivan

SPECIAL CORRESPONDENT
TIRUMALA

Chairman of the Indian Space Research Organisation (ISRO) K. Sivan has termed Cartosat-3 the most complex and advanced satellite India has ever developed.

It is also the satellite with the highest-ever resolution that the ISRO has developed till date.

Speaking to the media here on Tuesday, Mr. Sivan said the 26 hour countdown for the launch of PSLV-C47, which will carry the Cartosat-3 as well as 13 other customer satellites, began on Tuesday morning.

Expressing satisfaction

over the preparations, he said the launch would take place at 9.28 a.m. on Wednesday, from the second pad of the Satish Dhawan Space Centre in Sriharikota.

Cartosat-3 is mainly an earth observation satellite, which will provide spatial, spectral and temporal data for various fields including urban planning, agriculture, water resource management, environment and disaster management.

The ISRO chairman said the Chandrayaan-2 orbiter was doing fine and had been producing data which, in turn, was being given to the scientific community for proper analysis.

WEATHER WATCH

RAINFALL, TEMPERATURE & AIR QUALITY IN SELECT METROS YESTERDAY



TEMPERATURE DATA: IMD, POLLUTION DATA: CPCB, MAP: INSAT/IMD (TAKEN AT 18.00 HRS)

Forecast for Wednesday: Heavy Rainfall very likely at isolated places over Tamil Nadu, Puducherry and Karaikal.

CITY	RAIN	MAX	MIN	CITY	RAIN	MAX	MIN
Agartala	...	30.7	16.5	Kozhikode	...	35.0	24.6
Ahmedabad	...	31.6	19.2	Kurnool	...	31.8	20.2
Aizawl	...	22.1	11.5	Lucknow	...	28.5	13.9
Allahabad	...	31.3	15.8	Madurai	...	31.2	24.5
Bengaluru	...	27.3	16.7	Mangaluru	...	38.0	23.7
Bhopal	...	28.3	15.1	Mumbai	...	34.4	20.5
Bhubaneswar	...	30.4	18.5	Mysuru	...	28.0	18.5
Chandigarh	...	26.5	13.8	New Delhi	...	27.9	16.2
Chennai	...	31.1	23.1	Patna	...	28.6	17.6
Coimbatore	...	29.8	21.1	Port Blair	...	31.2	26.6
Dehradun	...	10.0	25.0	Puducherry	...	31.2	20.5
Gangtok	...	17.2	10.5	Pune	...	30.1	14.1
Goa	...	34.0	22.2	Raipur	...	30.8	18.0
Guwahati	...	27.8	17.0	Ranchi	...	28.5	13.6
Hubbali	...	28.0	19.0	Shillong	...	19.2	10.0
Hyderabad	...	29.0	17.8	Shimla	...	0.8	13.6
Imphal	...	25.3	...	Srinagar	...	...	...
Jaipur	...	27.4	18.4	Thiruvananthapuram	...	34.4	24.8
Kochi	...	33.4	25.6	Tiruchi	...	32.5	23.6
Kolkata	...	24.2	8.6	Vijayawada	...	30.3	20.4
Kolkata	...	29.9	20.0	Visakhapatnam	...	30.4	23.4

(Rainfall data in mm; temperature in Celsius)

Pollutants in the air you are breathing

CITIES	SO ₂	NO	CO	PM2.5	PM10	CODE	Yesterday
Ahmedabad	118	108	24	142	99	...	In observation made at 6.00 p.m., Patna, Bihar recorded an overall air quality index (AQI) score of 419 indicating a moderate level of pollution. In contrast, Shillong, Meghalaya recorded a healthy AQI score of 27.
Bengaluru	05	50	61	74	95	...	
Chennai	12	17	30	98	...	...
Delhi	23	90	87	327	231	...	
Hyderabad	17	49	33	268	...	...
Kolkata	14	91	29	324	308	...	
Lucknow	38	48	44	406	...	...
Mumbai	08	59	46	193	172	...	
Pune	85	15	70	175	122	...	
Visakhapatnam	...	44	...	...	...	...

Air Quality Code: ■ Poor ■ Moderate ■ Good (Readings indicate average AQI)

SO₂: Sulphur Dioxide. Short-term exposure can harm the respiratory system, making breathing difficult. It can affect visibility by reacting with other air particles to form haze and stain culturally important objects such as statues and monuments.

NO₂: Nitrogen Dioxide. Aggravates respiratory illness, causes haze to form by reacting with other air particles, causes acid rain, pollutes coastal waters.

CO: Carbon monoxide. High concentration in air reduces oxygen supply to critical organs like the heart and brain. At very high levels, it can cause dizziness, confusion, unconsciousness and even death.

PM2.5 & PM10: Particulate matter pollution can cause irritation of the eyes, nose and throat, coughing, chest tightness and shortness of breath, reduced lung function, irregular heartbeat, asthma attacks, heart attacks and premature death in people with heart or lung disease

IN BRIEF



Cartoonist Sudhir Dhar dies at 87

Renowned cartoonist Sudhir Dhar, whose works have graced several newspapers in a career spanning 58 years, died on Tuesday after suffering a cardiac arrest, his family said. He was 87. Dhar began his career with *The Statesman* in 1961, after which he moved to *Hindustan Times*. His cartoons have also appeared in *The Independent*, *The Pioneer*, *Delhi Times*, *New York Times*, *Washington Post* and *Saturday Review*, among others. • PTI

Mamata, Governor trade charges in Assembly

The acrimony between the TMC government and the West Bengal Governor reached the Assembly on Tuesday, with Chief Minister Mamata Banerjee and Mr. Dhankar taking swipes at each other during an event to observe the Constitution Day.

ED takes over assets of Kashmiri businessman

The ED has taken into possession immovable properties worth ₹6.20 crore, of Kashmiri businessman Zahoor Ahmad Shah Watali in a terror funding case. The case is against Lashkar-e-Taiba founder Hafiz Saeed and others. "Action has been taken under the Prevention of Money Laundering Act," an official said.

Boycott of Sangai to continue: Manipur body

Notwithstanding the talk between Union Home Minister Amit Shah and the team from Manipur, the Coordinating Committee on Manipur Integrity announced on Tuesday that the boycott of the Sangai festival would continue.

CBSE moots new question paper pattern

PRESS TRUST OF INDIA
NEW DELHI

The Central Board of Secondary Education (CBSE) would introduce major changes in the pattern of question papers for classes 10 and 12 by 2023 to boost creative, critical and analytical thinking among students.

It is the need of the hour keeping in mind the country's future, CBSE Secretary Anurag Tripathi said at the school education summit organised by the Associated Chambers of Commerce and Industry of India (ASSOCHAM). "While this year, students of Class 10 will get 20% objective questions and 10% questions based on creative thinking, by 2023, question papers for classes 10 and 12 will be based on creative, innovative and critical thinking," he said. Vocational subjects do not find takers in India, he said.

Logo, motto introduced for Lokpal

An open competition was conducted, inviting entries for both

SPECIAL CORRESPONDENT
NEW DELHI

Lokpal Chairman Justice (retired) Pinaki Chandra Ghose on Tuesday launched the new logo for the apex anti-corruption ombudsman. A new motto, 'Ma Gridhah Kasyasvidhanam' (Do not be greedy for anyone's wealth), was also adopted.

Lokpal members and its functionaries were present on the occasion.

Entries invited

Earlier, an open competition was conducted, inviting entries for the logo and the motto. A total of 2,236 entries for the logo and 4,705 entries for the motto were received.



New beginning: Justice (retired) Pinaki Chandra Ghose and other members at the launch. • SPECIAL ARRANGEMENT

A logo designed by Prashant Mishra, a resident of Prayagraj in Uttar Pradesh, was finally selected.

"The logo symbolises how Lokpal protects and cares for the people of India by es-

tablishing justice as per law," said an official release.

"The logo figuratively symbolises the essence of Lokpal, with the inclusion of shapes such as the ombudsman [Judges' Bench], the

people [three human figures], vigilance [an Ashoka Chakra forming an eye], the law [a shape of a book] and the judiciary [two tri-color hands placed below, forming a unique balance]," it said.

Suggestions for motto

For the motto, none of suggestions made were found suitable. "The Lokpal has decided its motto/slogan based on their own inputs and discussions held on October 17, 2019," said the body, adding that the Bench unanimously decided the motto.

The Lokpal became functional after the appointment of its Chairman and members in March.

Action to combat global warming inadequate: UNEP

'Countries must cut greenhouse gas emissions three-fold'

SPECIAL CORRESPONDENT
NEW DELHI

Ahead of the 25th edition of the Conference of Parties (COP) in Madrid in December, the United Nations Environment Programme (UNEP) has warned that countries' action to combat global warming is inadequate.

On the whole, countries must cut greenhouse gas (GHG) emissions at least three-fold to have a fighting chance at containing the severest effects of global warming.

"Unless global greenhouse gas emissions fall by 7.6% each year between 2020 and 2030, the world will miss the opportunity to get on track towards the

1.5°C temperature goal of the Paris Agreement," says a statement accompanying the UNEP report.

Anticipated emissions

Every year, the UNEP assesses the gap between anticipated emissions in 2030 and levels consistent with the 1.5°C and 2°C targets of the Paris Agreement.

The report finds that greenhouse gas emissions had risen 1.5% per year over the last decade and emissions in 2018, including from land-use changes such as deforestation, hit a new high of 55.3 gigatonnes of CO₂ equivalent. Global temperatures have already risen about 1°C since pre-industrial times and negotiations,

such as the COP, are aimed at preventing temperatures from rising more than one degree. Current commitments by countries will see temperatures rise by 3.2°C over pre-industrial levels.

'Bleak findings'

According to the report, the summary findings are bleak. "Countries collectively failed to stop the growth in global GHG emissions. Deeper and faster cuts are now required."

India is the third-largest emitter behind the United States and China respectively. India's per capita emissions, however, are significantly below the United States, China and many others.

'Bhopal gas tragedy exemplifies violence on nature'

SIDHARTH YADAV
BHOPAL

"Look! That's Gandhi leading us," says Rajagopal P.V., striding steadfast along with a band of 50 *padayatri*s, Indians and others from 10 countries, with a mission to reach Geneva before Octo-

ber 2, 2020. "We're collecting case studies from the grass-roots to present them to the United Nations," he says, in old Bhopal on Tuesday.

The Jai Jagat yatra, a global peace march, continues from the Union Carbide fac-

tory in the city. Leading from the front is a woman, deftly balancing on her head a pot carrying soil taken from Mahatma Gandhi's samadhi.

"The Bhopal gas tragedy is an example of violence on nature in the name of development. We'll take it up

with the United Nations and tell them to reconsider this model," says Mr. Rajagopal, a founding member of the Ekta Parishad. Traversing 12 countries over 12 months, the band will meet with international institutes to highlight grass-roots issues.

BHARAT DYNAMICS LIMITED
(A Government of India Enterprise)
MINISTRY OF DEFENCE
GACHIBOWLI, HYDERABAD-500 032.

Ref: BDL/CC/OT/GT/021/2019-20 Dt: 27.11.2019

e-PROCUREMENT ABRIDGED TENDER NOTICE
Inviting Indigenous Competitive Bidding

Sl.No.	Tender ID	Description
1	61612	Supply, installation & commissioning of Vibration Machine
2	61548	Supply, Installation and Commissioning of HVAC for New Invar Non-Explosive Building
3	61549	Supply, Installation and Commissioning of chiller and Electrical Panel for Reciprocating Chiller

Please visit website <https://bdltenders.abcpocure.com> for further details. Bids should be submitted online only.
"Corrigendum if any shall be issued through our e-portal only and not in Newspapers".
Addl. General Manager (Corp. Comm.)

Tamil Nadu Handicrafts Development Corporation Limited
(A Government of Tamil Nadu Undertaking)
Corporate Office: 759, Anna Salai, Chennai-600 002

Tender Reference: THDC/937/IT/19-20 dated 27.11.2019

Sealed tenders are invited for the "Design Research and Development Centre (DRDC) Services" for Tamil Nadu Handicrafts Development Corporation Ltd (THDC). For more details, the Tender documents may be downloaded from websites <http://www.tenders.tn.gov.in> and <http://www.thnhdcltd.com> freely and referred.

Earnest Money Deposit (EMD) amount	Rs. 50,000 (Rupees Fifty Thousand only) by way of Demand Draft drawn in favour of "Tamil Nadu Handicrafts Development Corporation Ltd" payable at Chennai.
Pre-bid meeting	On 06.12.2019 at 4.00 PM
Due date and time of submission of sealed tenders	Sealed Tenders should be submitted on or before 11.12.2019 at 3.00 PM
Due Date for Obtaining the Tender Document	11.12.2019 upto 1.00 PM
Date and time of opening of Tender & Technical Bid.	On 11.12.2019 at 4.00 PM

DIPR/4565/Tender/2019
Chairman & Managing Director

KARNATAKA STATE WAREHOUSING CORPORATION
"Bheja Bhavan Building", 4th & 5th Floor, Bellary Road, Hebbal, Bengaluru - 560 024. Tel: 080-23415679 Fax: 080-23415672. Website: www.karnatakastatewarehousing.com

No:KSWC/TECH/ALP-Tender-82/3225/2019-20 Date: 26.11.2019
SHORT TERM Re 'e' -TENDER NOTIFICATION (Call-2)

Tenders are invited through online e-Procurement portal from the licensed manufacturers for supply of **Aluminium Phosphide Tablets 25,000 Kgs** to the Regional Managers offices located at Mysore, Bangalore, Shimoga, Davanagere, Hubli, Kalburagi and Raichur in the state. Tenders are invited as per the Karnataka Transparency in Public Procurement Act-1999 and Rules 2000. Accordingly the two cover bid system consisting of Technical bid and Financial bid shall be followed. The Last Date & Time for submission of Tenders through online e-procurement portal: **06.12.2019 upto 4.00 PM**. Interested tenderers may contact website: www.eproc.karnataka.gov.in & www.kswc.in or help desk No:080-23010900/23010901 or this office.

DIPR/DDU/1727/2019-20
Managing Director, KSWC.

Coconut Development Board
(MINISTRY OF AGRICULTURE & FARMERS WELFARE, GOVERNMENT OF INDIA)
Kerabhanur, SRV Road, Kochi, Kerala, Pin-682011. Ph: 0484-2377286, 67 Website: www.coconutboard.gov.in

Scheme for Market promotion

Coconut Development Board is extending support for brand promotion to manufacturers of branded coconut products. Details of the scheme is available in the website at the following link - <http://www.coconutboard.gov.in/docs/appl-brand-build-support.pdf> Interested entrepreneurs may kindly submit the proposals for market promotion of their branded coconut products in the prescribed format to Chairman, Coconut Development Board, Kera Bhavan, Kochi - 682011.
Deputy Director

GOVERNMENT OF INDIA NATIONAL BOARD FOR HIGHER MATHEMATICS DEPARTMENT OF ATOMIC ENERGY MUMBAI-400001

Advt. No.19-A/IMSc/2019 Date: 26-11-19

THE NBHM DOCTORAL SCHOLARSHIP SCHEME 2020 ANNOUNCEMENT OF THE WRITTEN TEST

The National Board for Higher Mathematics (NBHM), DAE, invites applications exclusively online on the portal <https://nbhmscholarships.in> for its Doctoral Scholarship Test to be held on **Saturday, 25 January 2020**. The test is the first of two steps in the selection process for the NBHM Doctoral Scholarship given to support pursuit of research leading to the Ph.D. Degree in Mathematics / Applied Mathematics. The test scores are also used by the following institutions to screen candidates for entrance to their Ph.D. / Integrated Ph.D. programmes: Harish Chandra Research Institute (HCRI), Allahabad; Indian Institute of Science Education and Research (IISER), Mohali; Indian Institute of Science Education and Research (IISER), Pune; National Institute of Science Education and Research (NISER), Bhubaneswar; and The Institute of Mathematics Sciences (IMSc), Chennai.

For further details, please visit <https://www.imsc.res.in/~nbhm/>

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The Company reserves the right to reject all or any of the Bids or cancel the bidding process at any stage without assigning any reasons whatsoever and without any liability.

For any clarification, contact at e-mail id powertrading@noidapower.com or mobile no. **9718804966**.