



# E - NEWS

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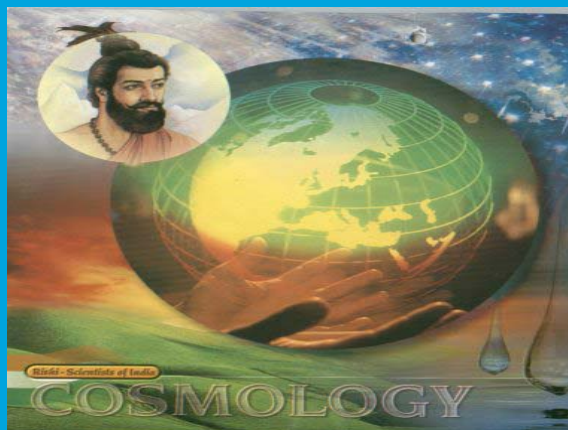
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## ACHARYA KAPIL (3000 BCE)

FATHER OF COSMOLOGY

Celebrated as the founder of Sankhya philosophy, Acharya Kapil is believed to have been born in 3000 BCE to the illustrious sage Kardam and Devhuti. He gifted the world with the Sankhya School of Thought. His pioneering work threw light on the nature and principles of the ultimate Soul (Purusha), primal matter (Prakruti) and creation. His concept of transformation of energy and profound commentaries on atma, non-atma and the subtle elements of the cosmos places him in an elite class of master achievers - incomparable to the discoveries of other cosmologists. On his assertion that Prakruti, with the inspiration of Purusha, is the mother of cosmic creation and all energies, he contributed a new chapter in the science of cosmology. Because of his extrasensory observations and revelations on the secrets of creation, he is recognized and saluted as the Father of Cosmology.

## READER'S RESPONSE

The editorial team invites your views, suggestions, to the News about Members Column and contributions to the e-news.

## India's aeronautics industry needs 1.5 lakh crore: Scientist

Drawing a roadmap for the aeronautics industry (civil and defence) in the country for the next ten years, a senior scientist has estimated the required investment to be about Rs 1.5 lakh crore. Defence Research and Development Organisation (DRDO) Chief Controller, Research and Development (R&D), DR Prahlada projected this requirement, while making a presentation to members of the industry and scientists. Experts from organisations like Hindustan Aeronautics Limited (HAL), National Aerospace Laboratories (NAL) and private industries, echoed the observation. In the presentation, a copy of which is in the possession of Deccan Herald, Dr Prahlada said that of the Rs 1.5 lakh crore investments, about Rs 60,000 crore will be needed for the defence sector alone. He said that while there still needs to be some amount of investment made into the basic trainers, India's ambitious Light Combat Aircraft (LCA), the Fifth Generation Fighter Aircraft (FGFA), Medium Multi-Role Combat Aircraft (MMRCA), Medium Combat Aircraft (MCA), helicopters and others, considerable amounts of money need to be put into newer aircraft like Unmanned Aerial Vehicle (UAV) and Unmanned Combat Aerial Vehicle (UCAV).

Source: *Deccan Herald*

## 4 DRDO labs taken off US blacklist on tech transfer

The US has taken off four DRDO laboratories, including its armament lab, from its Entity List, revoking the ban on technology transfer to them following the US President, Mr Barack Obama's promise during his visit to the country last month. The DRDO labs, including the Armament Research and Development Establishment (ARDE), were blacklisted by the US in the aftermath of the 1998 nuclear tests by India. 'Yes, the sanctions have been lifted. The four DRDO labs have been taken off one of the categories under which technology transfer was banned,' the DRDO Chief Controller for Research and Development (Armament and Combat Engineering), Mr S. Sundaresh, told reporters.

Source: *Hindu Business Line*

## Star City awaits Indian astronauts

It cannot be confirmed where humankind's next step in space will be, but the Indian Space Research Organisation (ISRO) has set its sights on "Star City". This is not some self-luminous heavenly body up in the sky, but a state-of-the-art astronauts' training facility which the ISRO plans to build over a sprawling 50-acre piece of land at Yelahanka on the City's northern outskirts. As terrestrial as it will be, "Star City", which will be otherwise known as Astronaut Training and Biomedical Engineering Centre, may resemble the one in Russia where cosmonauts and astronauts from all over the world train to fly on the Russian Soyuz spacecraft. Speaking to Deccan Herald, a highly placed ISRO source said the centre "will have all the required facilities to house our crew and the select astronauts who have been selected to undergo training for their 2015 moon mission."

Source: *Deccan Herald*

## HYLAS satellite reaches geostationary orbit

The Highly Adaptable Satellite (HYLAS), which was launched successfully, by the European Ariane-5 V198 launch vehicle,

has reached the geostationary orbit. The Highly Adaptable Satellite, jointly built by ISRO's commercial arm Antrix and EADS's Astrium of Europe for Advent communications of UK, was initially injected into an elliptical Geosynchronous Transfer Orbit (GTO) with a perigee of 250 km, apogee of 35,906 km and inclination of 1.99 deg.

Source: *Indian Express*

## A novel approach to space electronics

A five-year project led by the Georgia Institute of Technology has developed a novel approach to space electronics that could change how space vehicles and instruments are designed. The new capabilities are based on Silicon-Germanium (SiGe) technology, which can produce electronics that are highly resistant to both wide temperature variations and space radiation. The project was funded by National Aeronautics and Space Administration (NASA). "The team's overall task was to develop an end-to-end solution for NASA - a tested infrastructure that includes everything needed to design and build extreme-environment electronics for space missions," said Mr John Cressler, who is a Ken Byers Professor in Georgia Tech's School of Electrical and Computer Engineering. Cressler served as principal investigator for the project.

Source: *Hindu*

## Space agencies ink MoU on study of earth system

The Indian Space Research Organisation and its French counterpart Centre National d'Études Spatiales inked a Memorandum of Understanding for studies in earth system science and climate. ISRO chairman Dr K Radhakrishnan and CNES Mr Yannick d'Excatha signed the MoU in the presence of Prime Minister Dr Manmohan Singh and the visiting French President Mr Nicholas Sarkozy. "The areas of space, science and technology, research and development and green technologies are emerging as the new sources of growth that can drive our relationship forward in the coming years," said Dr Singh, noting that France had been highly supportive of India's space capabilities in Europe and we value its support immensely. "India and France intend to broaden the scope of their exchanges and further develop their joint efforts in this field," read the joint statement issued after Singh-Sarkozy delegation-level talks at Hyderabad House.

Source: *Deccan Herald*

## Students must focus on space research'

There is a need for more astrophysicists and astronomers in the country and towards this end more centres of excellence to attract students into astronomy should be set up, said Dr K Kasturirangan, renowned scientist and former ISRO chairman. Speaking at the Chandrashekhar centenary conference, Dr Kasturirangan said although India has adequate facilities to conduct research in astronomy, the number of scientists engaging in international collaboration is very few. "We are lacking in building

space systems and telescopes. There are very few scientists who can visualise the way Mr Chandrashekhar did in the field of Astrophysics. We need to take physics forward in both theoretical and practical methods," he said.

*Source: Deccan Herald*

## **Work on supersonic BrahMos missile over, trials to wait**

BRAHMOS Aerospace, an Indo-Russian joint venture, has completed the work on aerial and underwater versions of a supersonic cruise missile, but the test-fire of the two variants, is held up for the time being in the absence of platforms for trials. The test-fire of underwater version of the missile will take place early next year while the trial of air-borne variant is likely to be held in 2012, sources said. Mr Alexander Leonov, director general of NPO Mashinostroyeniya, which is the Russian partner of the joint venture, said work on both aerial and submarine versions of the missile has been completed and they are ready for trial. He said BrahMos scientists are now waiting for the Su-30MKI aircraft to be provided by the Indian Air Force to act as a platform for testing the aerial version while a specially-designed submerged vehicle will be used for trial of the submarine version.

*Source: Indian Express*

## **New airport policy awaits cabinet nod**

A new airport policy for Karnataka could be in place as early as February 2011. This is expected to fuel growth of the economy in tier-2 and tier-3 cities in the state and offer connectivity to Bangalore. A draft policy is currently being modified and is expected to be finalised and placed before the state cabinet for approval by January end or February 2011, said sources in the State Infrastructure Development Department (IDD). "The policy will have guidelines on development of airports with private participation," said a source. "Karnataka is the only state to have mooted an idea of an exclusive airport policy." The source said the draft would most likely be placed before the cabinet in the next three to four weeks. The government has commenced work to develop five new airports in Shimoga, Hassan, Bijapur, Gulbarga and Bellary, and is awaiting clearance from the Directorate General of Civil Aviation (DGCA) for Gulbarga and Bellary airports.

*Source: Indian Express*

## **Most comprehensive moon map**

Researchers have created the most detailed and comprehensive map of the moon's complex landscape thanks to data provided Lunar Reconnaissance Orbiter (LRO), report agencies from Washington. "This dataset is being used to make digital elevation and terrain maps that will be a fundamental reference for future scientific and human exploration missions to the moon," said Mr Gregory Neumann of Nasa's Goddard Space Flight Centre. After about a year taking data, we already have nearly three billion data points from the Lunar Orbiter Laser Altimeter (LOLA) on board the LRO spacecraft." The new LOLA maps are more accurate and sample more places on the lunar surface than any available maps before, according to a

Nasa statement. In terms of coverage, the nearly three billion range measurements so far LRO compare to about eight million to nine million each from three recent international lunar missions, says Neumann. "They were limited to a mile or so between individual data points, whereas our measurements are spaced about 57 metres apart in five adjacent tracks separated 15 metres." "Recent papers have clarified some aspects of lunar processes based solely on the more precise topography provided new LOLA maps," adds Mr Neumann, "such as lunar crater density and resurfacing or the formation of multi-ring basins".

*Source: Deccan Herald*

## **GSLV mission fails as rocket explodes after lift off**

Home grown vehicle failed after the rocket exploded mid air minutes after the lift-off from the spaceport here. The mission, aimed at putting India in a club of countries with the technology to put heavy satellites in orbit, failed when the rocket developed a snag soon after lift-off in the first stage itself. GSAT-5P, carrying 24 C-band and 12 extended C-band transponders, was meant for augmenting communication services currently provided by the Indian National Satellite System. Built at '125 crore, the satellite was to replace the INSAT-3E that was sent up more than a decade ago. The rocket blasted-off at around 4 pm from the second launch pad at the Satish Dhawan Space Centre at the end of the 29-hour countdown but was hit by a snag in the first stage itself, ISRO sources said. "The incident occurred in the first stage itself," the sources said, adding, details would be disclosed later. This is the second failure this year for ISRO after the previous (Geosynchronous Satellite Launch Vehicle) GSLV mission with the country's maiden cryogenic engine hit a snag and the rocket plunged into the Bay of Bengal on April 15 this year. ISRO had postponed the December 20 launch of the Geosynchronous Launch Vehicle (GSLV-F06), in its seventh mission, after a minor leak was noticed in the Russian Cryogenic engine during the pre-countdown checks. The last GSLV mission (GSLV-D3) failed after the malfunctioning of indigenous cryogenic stage, dampening the country's hopes of joining the elite club of five nations with such capability.

### **Pall of gloom at GSLV mission control**

Gloom descended at the mission control centre of ISRO's spaceport as India's aim of augmenting communication services failed after GSLV-F06 carrying GSAT-5P met with an unexpected end. This is the second consecutive failure of Geo-Stationary Launch Vehicle after the GSLV-D3 mission using India's own cryogenic engine after the first one had ended unsuccessfully in April this year. Minutes after the lift-off from the second launch pad at the Satish Dhawan Space Centre, GSLV F06 was seen exploding, leaving in its trail red and orange colour flames. A melancholic silence enveloped the mission control tower where the country's top-most scientists, including ISRO Chairman Dr K Radhakrishnan, were glued to the monitors. As the scientists saw the rocket go up in flames, silence gave way to murmurs of disappointment.

*Source: Economic Times*

## Tejas test-fires R-73 missile successfully

India's Tejas LSP-4 aircraft successfully test-fired the R-73 close combat missiles from INS Hansa in Goa. A Tejas detachment has been operating from INS Hansa in Goa, conducting the last phase of flight trials. One of the main objectives of the current phase of flight trials was clearing the firing envelope of air to air close combat missile from the Tejas. The R-73 missile is the chosen air to air close combat missile for the Tejas. The test firing was piloted by Group Captain George Thomas, Group Director (Flight Test Operations) of the National Flight Test Centre, ADA. The test aircraft was accompanied by a chase Tejas piloted by Group Captain Mr Suneet Krishna. This critical test was closely monitored and controlled by the Test Director Wg Cdr Mr Toffeen, supported by the safety pilot, Group Captain (Retd) Mr R R Tyagi, from the mobile telemetry positioned at the test location.

Source: Deccan Herald

## DRDO develops rocket launcher for patrol boats

The patrol boats guarding country's coastline would be equipped with a home-produced rocket launcher bolstering their close combat capabilities. The Defence Research and Development Organisation (DRDO) has developed a new 140-mm rocket launcher keeping in mind requirements of the coastal security forces. The plan to pack small boats with lethal weapons is being implemented now as 12 rockets can be launched simultaneously from this system. The DRDO claimed that tests and evaluations had been completed by its lab proof and experimental establishment (PXE) based in Orissa.

Source: Indian Express

## India's nuclear triad to be ready soon

India's nuclear triad will be in place in the next two years when its home-made ballistic missile submarine INS Arihant will be ready for deterrent patrol. INS Arihant, being built with Russian help, was launched in 2009 and for the first time Navy Chief Admiral Mr Nirmal Verma talked about the progress of the project when he disclosed that it would be operational in 2011 or 12. With the ballistic missile submarine (SSBN) in the fleet, the third leg of India's nuclear triad — land, air and sea delivery platforms - would be complete. Admiral Verma's disclosure has put to rest speculation about the project getting delayed. The Admiral was confident that it would be ready for deterrent patrol in two years, meaning that submarine would be armed with nuclear-tipped ballistic missiles. The claim was made even as the submarine has to undergo various trials, including that of its nuclear reactor.

Source: Indian Express

## Boeing team begins building Indian Navy's 1st P-8I aircraft

The Boeing P-8I team began fabricating the first part for the Indian navy's first long-range maritime reconnaissance and anti-submarine warfare aircraft on Dec. 6 in Wichita. The P-8I, based on the Boeing Next-Generation 737 commercial airplane, is a variant of the P-8A Poseidon that Boeing is developing for the U.S. Navy. Employees at Spirit Aero Systems — where all Boeing Next-Generation 737 fuselages,

nacelles and pylons are designed and built — cut the P-8I's first part, a bonded aluminium panel that later will be installed on the fuselage's upper lobe to support an antenna. The panel and other fuselage components will come together on Spirit's existing Next-Generation 737 production line. "Today marks the P-8I program's move from the design phase to the build phase," said Mr Leland Wight, Boeing P-8I program manager. "We're on schedule and the Indian navy is looking forward to receiving its first plane."

Source: Airframer

## BEML exploring foray into helicopter, small aircraft assembly

Public Sector Undertaking BEML is exploring the possibility of venturing into the business of assembly of helicopters and small aircraft. "When you are in aerospace (business), it (assembly of helicopters and small aircraft) can't be out of your radar," Chairman and Managing Director of the Bangalore-headquartered Mini-Ratna company under the Ministry of Defence Mr V R S Natarajan said. "We are looking at the possibility," he said. BEML Ltd has made a set of landing gears for helicopters of Hindustan Aeronautics Limited and expecting orders, he said, adding, the company is already supplying some body parts of fighter aircraft. BEML is now setting up a facility for fabricating titanium metal, aluminium and composites - things used in manufacture of helicopters.

Source: Economic Times

## BDL nodal agency for Akash missile project

Bharat Dynamics Limited (BDL) has been chosen as the nodal agency to supply the Army version of the Akash missile system, India's first indigenous tactical missile system, developed by the Defence Research and Development Organisation (DRDO). The BDL has been given the orders for the supply of two regiments of Akash missile systems to the Army ahead of Bharat Electronics Limited (BEL) which had bagged the order to supply two squadrons of the systems to the Air Force worth Rs 1,221 crore. The BEL, which is scheduled to supply the first unit of the same by March 2011 and the first squadron by June, is also awaiting orders for another six squadrons estimated to be close to Rs 4,000 crore.

Source: Deccan Herald

## DRDO smart vest to be nano-based

Smart vests developed by the Defence Research and Development Organisation (DRDO) to monitor health and position of soldiers will now feature nano-sized electrodes. Speaking at the inauguration of the two-day "Bangalore Nano 2010", DRDO Chief Controller Dr W Selvamurthy said nano-technology, being developed by the Defence Bioengineering and Electromedical Laboratory in Bangalore, will be

utilised to improve the efficacy of these vests in difficult conditions. He said the smart vest is part of the 'soldier-as-a-system' project, whereby it will be possible to monitor whether a soldier is healthy or injured, alive or dead. A GPS system will also be woven into the vest so that every soldier can be tracked, he added. DRDO is also planning to set up a nano foundry by investing Rs 500 crore to Rs 600 crore. "This project will be a cluster with the partnering of IITs and other academic institutions of India. DRDO will also fund nano research at the academic institutions," he said.

*Source: Deccan Herald*

## **LCA trials off to a big start at Chitradurga**

Under the guidance of Aeronautical Development Establishment (ADE) and National Flight Test Centre (NFTC), Aeronautical Development Agency has activated the air-to-ground range at Chitradurga for weapon and drop tank jettison trials of Tejas, the Light Combat Aircraft. Consequent to operationalization of Bangalore International Airport (BIA), the air-to-ground range at Kolar was deactivated as it was coming in the traffic path of BIA. Then, the government had allocated land at Challakere near Chitradurga to set up a full-fledged aeronautical test range for use by all aeronautical system developers in the country.

*Source: Times of India*

## **Tejas completes drop-tank trial**

Drop tank, the high-safety critical manoeuvre performed by fighter aircraft, was successfully performed by the country's first indigenously developed Light Combat Aircraft Tejas on Friday at the recently-commissioned air-to-ground range at Challakere in Chitradurga. Jettisonable drop tanks, carried by combat aircraft after completing the mission, are required to be dropped from the mother aircraft for a quick get away from the enemy territory and other emergency situations, said an official release from the Defence and Research Development Organisation (DRDO). The release said that the 1,200-litre drop-tank jettison trial was conducted at a critical point in the jettison envelope on Tejas LSP-3 aircraft, piloted by Group Captain Mr Suneet Krishna at Challakere range. The trial aircraft was escorted by another Tejas PV-2, which captured the external video picture of the drop tank trajectory after release. To ensure safety of flight, clean separation of the tank with adequate clearances from the mother aircraft or neighbouring stores needs to be established from the flight test, the press statement said. This extreme-safety critical flight test requires thorough planning and preparation, supported by theoretical analysis and a level of verification of the predictions through ground tests on specialised test rigs set up for the purpose.

*Source: Hindu*

## **LCA induction to start in Jan**

Along with the 126 medium multi-role combat aircraft and fifth generation fighter aircraft LCA will be one of the mainstay planes of the IAF in the coming decades. The mark I planes will be inducted. The mark II version

of the LCA with a more powerful engine, better aerodynamics and advanced avionics is also under development. The naval version of the LCA, to be used in aircraft carriers, are also under development. Most of the delay in the LCA programme was due to the technical difficulties and resource crunch faced research team under defence research and development organisation. The problem was compounded sanctioned imposed US in 1998 following Pokhran II. All of a sudden, scientists found that the door was shut on them and many key components and equipment needed for producing a fighter plane was simply not available. Subsequently, they had to develop those sub-systems as well.

*Source: Deccan Herald*

## **DRDO successfully completes trials of big aerostat system**

The Defence Research and Development Organisation (DRDO) has successfully completed the trials of a big aerostat system developed by it. During the trials, which comprised surveillance over Agra and interception of a variety of communications, the aerostat carried electro-optic and communication intelligence payloads. The trials were completed on December 25. The DRDO has also developed electronic intelligence and radar payloads that will be put to use in the aerostat. The entire system was designed, developed and integrated by the Aerial Delivery Research and Development Establishment (ADRDE), Agra Cantonment. The ADRDE, a premier laboratory of the DRDO, specialises in developing parachutes, lighter-than-air systems, and flotation systems and aircraft arrester barriers. It has developed and supplied a variety of parachutes for a wide range of applications that include Para-dropping of troops, weapons and combat vehicles; braking of fighter aircraft; and recovery of payloads of missiles and unmanned aerial vehicles and the Indian Space Research Organisation's recoverable satellite. The laboratory has now diversified into lighter-than-air technologies and developed small and medium-sized aerostats. It recently developed a medium-sized aerostat filled with helium gas and flew it successfully one km over Agra. Dr Prahlada, Chief Controller (Aerospace and Services Interaction), DRDO, praised the ADRDE for graduating from a laboratory that designed and developed balloons, parachutes and heavy air-drop systems to developing systems of systems. The aerostat systems, their ground-based command and control systems and payloads were integrated for full exploitation. An aerostat had a thermal camera for use at night and in low visibility conditions. The electronic intelligence payload carried a communication intelligence system for capturing and analysing a variety of communication. It would be useful for all the three Services, the paramilitary forces and civilian applications, including disaster management, Dr. Prahlada said. Several high-end technologies the DRDO developed along with big and medium-sized industries in the aerodynamic design of balloons, fabrics, hydraulic winch, electro-optic tether, high pressure helium cylinder manifold led to the realisation of this aerostat platform, DRDO scientists said.

*Source: THE HINDU*

## India launches 1st aerostat radar

DRDO scientists successfully test fly the surveillance probe-on-balloon in Agra India has taken a step forward to have an indigenous aerostat for border surveillance with scientists successfully demonstrating its capability in the last three days. The indigenous aerostat — a giant helium-filled balloon tethered to the ground — carried electro-optic and COMINT (communication intelligence) payloads, said officials from defence research and development organisation. On the Christmas Day, scientists at Aerial Delivery Research and Development Establishment in Agra carried out surveillance all over Agra and intercepted a variety of communications by flying the aerostat up to an altitude of one km. The complete balloon system, ground-based command and control systems and the payloads were integrated for the three-day trial that culminated. DRDO claims the aerostat can carry out steering, scanning and tracking with high precision. The payload also contains a thermal-imaging camera for surveillance during night and in low visibility conditions. "Trials had been completed and the aerostat is ready for induction. Both the Army and Air Force are showing interest, but there are no orders from them as yet," said a DRDO spokesperson.

### Security holes

Besides enhancing surveillance along the Pakistan and China border, the forces are in the need of aerostats to plug the gaping security holes along India's 7,500 km coastline, which is increasingly becoming vital from a strategic perspective. ADRDE conducted the first trial of the 2,000 cubic metre balloon more than a year ago. But more trials were needed to validate various subsystems mounted on the balloon. Payload details The electronic intelligence payload carries a communication intelligence system for capturing and analysing all types of communication in air. Incidentally, as DRDO completed the development of its indigenous aerostat named Divya Chakshu, another aerostat — developed by National Aerospace Laboratories — is waiting for a trial since the last two years in the absence of a flight testing range. The National Aerospace Laboratories product is six times smaller than the DRDO but can be useful for disaster and Para-military operations including the fight against Naxals

Source: DECCAN HERALD

## Indian MMRCA contract by March 2011: IAF Chief

The Indian contract to buy 126 MMRCA fighter aircraft is expected to be signed by March 2011, the Indian Air Force Chief of Staff, Mr P.V. Naik has been quoted as saying. In an interview to Vayu Aerospace, a media partner of defenseworld.net, the air force chief said that the likely timeframe for completing various activities before the contract is signed is about 6-8 months, "So, we expect the contract to be signed by March 2011. From thereon, the induction should begin by mid 2014 onwards". The RFP for the M-MRCA was issued in August 2007 to six global vendors. These vendors responded with their proposals and the TEC was completed in June 2009. By this time, the IAF was already ready to undertake Field Evaluations and these were conducted from July 2009 to May 2010, the Air Chief said.

Source: Defenseworld.net

## National body to curb bird strikes

In view of increasing bird strikes on aircraft, a national advisory body is being set up to study and assess the risk from avian behaviour and devise measures to control the menace. "The Directorate-General of Civil Aviation (DGCA) will assume the lead role in setting up the advisory body on bird strikes," sources close to the development said. The body will be registered during the week. It is being set up on the pattern of International Bird Strike Research Group - a consortium of aerospace companies and other aviation organisations for researching and assessing the risk of bird strikes. Sources said the need for such a body had been long felt due to mushrooming incidents of bird-hits that have caused losses to airline operators besides imperilling passenger safety. In 2009 alone, there were close to 300 bird strikes on aircraft across the country resulting in a loss of over Rs 7 crore to aviation companies.

Source: Deccan Herald

## ISRO hands 2 contracts to Arianespace, renews deal with EADS

Indian Space Research Organisation has given an estimated Rs 500 crore order to Arianespace and renewed the five-year contract with EADS Astrium for joint marketing of satellites; it was announced during the visit of French President Mr Nicholas Sarkozy. "We have signed commercial agreements with Arianespace for two more launches — GSAT-8 in 2011 and GSAT-10 in 2012", ISRO Chairman Mr K Radhakrishnan said. He did not specify the contract value but ISRO sources said launch cost of each satellite is around Rs 250 crore. Mr Radhakrishnan said Arianespace, the European launcher which operates from France's territory of Atlantic coast in South America, has so far launched 12 Indian satellites. He also announced that a strategic alliance signed between EADS Astrium, Europe's leading satellite system specialist, and ISRO in 2005 was renewed today for another five years.

Source: Deccan Herald

## Domestic airlines cut fares by up to 25 pc

Domestic airlines have lowered the overall air fares by 20 to 25 per cent after the Civil Aviation Ministry and the DGCA cracked the whip on them for charging very exorbitant prices in the last few weeks. The fares for tickets bought both at the last minute and in advance during November-December were, however, yet to return to the average levels during the same period last year. The overall airfares on several sectors have come down in the past week, official sources said, adding that the "pressure" mounted by the Civil Aviation Ministry and the Directorate General of Civil Aviation (DGCA) against exorbitant airfares had been a success, officials told

PTI. The fare hike had also led to a public outcry. The DGCA and Civil Aviation Minister Mr Praful Patel had in the last few days warned of action if the errant airlines did not roll back the abrupt hike in air fares. Air fares, especially the last-minute or spot tickets, had skyrocketed even during the non-peak season.

Source: *Indian Express*

## India Civil Aerospace Industry to Grow at 16.7% CAGR by 2013

Fast growing air passenger traffic and developments in low cost carriers sector will enable the industry to register 16.7% CAGR growth during 2010-2013, says RNCOS. According to our new research report "Indian Aerospace Industry Analysis", the aerospace industry has witnessed skyrocketing growth in the past few years. The government's open sky policy has attracted many overseas players to enter this market and the industry is growing both in terms of players and the number of aircrafts. Industry showed tremendous resilience against recession and passenger traffic posted double-digit growth rate in FY 2010. The research further revealed that on the strong fundamentals of augmenting traffic and other factors, the civil aerospace industry would continue to post double-digit CAGR growth by 2013.

Source: *PR-USA.net*

## Preliminary design contract signed for 5G fighter aircraft

A contract for Preliminary Design of the Indo-Russian Fifth Generation Fighter Aircraft was signed between Hindustan Aeronautics Limited (HAL), Rosoboron export and Sukhoi. The contract was signed making this the biggest defence programme ever in the history of India involving production of over 200-250 aircraft with the total cost, including options and the value of production aircraft. The aircraft, to be jointly developed is termed Perspective Multirole Fighter (PMF), involves design and development of a Fifth Generation fighter Aircraft (FGFA). The FGFA is said to have advanced features such as stealth, super cruise, ultra-maneuvrability, highly integrated avionics suite, enhanced situational awareness, internal carriage of weapons and Network Centric Warfare capabilities, a release by HAL said. PMF draws upon the basic structural and system design of the Russian FGFA Technology Demonstrator with modifications to meet IAF specifications which are much more stringent.

Source: *Indian Express*

## Aviation sector recorded 25% growth last month

THE aviation sector continues to fly high with air traffic for November growing close to 25% compared to traffic in the same month last year. This is the eleventh straight month that domestic air traffic has witnessed an uptrend. Between January and November this year, domestic airlines have flown 46.8 million passengers, up 19% compared to the same period in 2009, monthly data released by aviation regulator Directorate General of Civil Aviation (DGCA) shows. Mr Naresh Goyal-owned Jet Airways group maintained its position as the leading carrier with a 26.2% market share, while Dr Vijay Mallya-owned Kingfisher Airlines came second with 19.1% share. But the interesting fact was that low-cost airline Indigo piped national carrier Air India in November from the third spot, by retaining 17.3% of the market share. Analysis of capacity and demand data on year-to-year basis indicates that although the capacity remained almost at the level of October 2010, the demand in November 2010 was comparatively more," an official statement said.

Source: *Economic Times*

## HAL signs pact with Russian cos to design fighter aircraft

Hindustan Aeronautics Ltd has signed a contract with Roso boron export and Sukhoi for preliminary design of the Indo-Russian Fifth generation fighter aircraft. The project involves design and development of a fifth generation fight aircraft that will have advanced features such as stealth, super cruise, ultra-maneuvrability, highly integrated avionics suite, enhanced situational awareness, internal carriage of weapons and network centric warfare capabilities, an official statement issued here stated. The aircraft to be jointly developed is termed Perspective Multi-role Fighter (PMF), which draws on the basic structural and system design of the Russian FGFA Technology Demonstrator with modifications to meet IAF specifications. The broad scope of bilateral cooperation during the joint project covers the design and development of the PMF, its product ionisation and joint marketing to third countries.

Source: *Hindu Business Line*

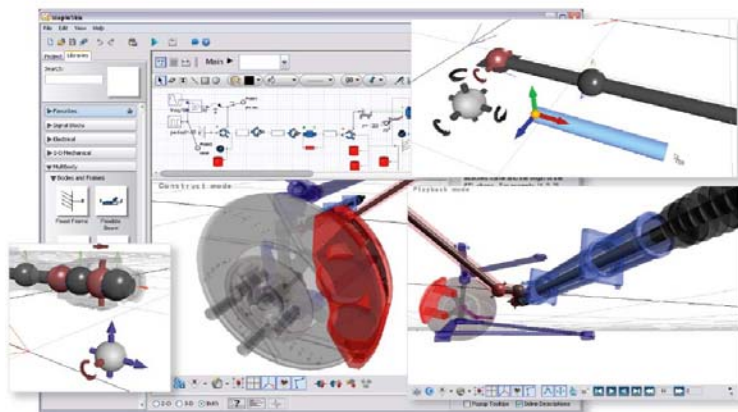
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### Assessing the Accuracy of a Rocket's Trajectory Through Space



Creating a detailed model that took into account specifications of the rocket as well as environmental conditions allowed the engineer to investigate the design parameters and determine the effect atmospheric conditions have on the trajectory of the rocket. With the results from the Monte Carlo simulation, the rocket manufacturer determined the probable bounds of the rocket's trajectory and then used this information to create comprehensive operating guidelines for customers.

*"With the use of MapleSim, the base model of the rover was developed in a month," says Dr. Khajepour. "The benefits of MapleSim compared to traditional tools are significant. We now have the mathematical model of the 6 wheeled rover without writing down a single equation. MapleSim was able to generate an optimum set of equations for the rover system automatically which is essential in the optimization phase."*

Dr. Amir Khajepour, Canada Research Chair in Mechatronic Vehicle Systems and Professor of Engineering in the Mechanical and Mechatronics Engineering department at the University of Waterloo (UW), is working with the Canadian Space Agency (CSA), Maplesoft, and the Government of Canada, to develop a full solution for the power management system of autonomous rovers. Dr. Khajepour is a leading figure in mechatronics and robotics and he has chosen MapleSim, an advanced physical modeling tool from Maplesoft, as a key tool in his project.

*"The original model was about 1/10 the complexity of the MapleSim model but took me days to develop. MapleSim saved me many hours of work because the model maps onto the topology of the physical system and the dynamic equations do not have to be developed by hand. This also enables very complex multi-disciplinary system models to be built and analyzed by a single person. MapleSim converts a painstaking and laborious process into one that is simple and enjoyable."*

Dr. Richard Gran, President and CEO of The Mathematical Analysis Company.