



11-04-2024

God Particles

Why in News?

- Peter Higgs, the European scientist who won the 2013 Nobel Prize in Physics for describing the Higgs boson (God particle) - a theoretical particle that explains where mass comes from and advances man's understanding of how the world is constructed - died recently at the age of 94 after a short illness.

More About the News

- The Higgs boson is the fundamental force-carrying particle of the Higgs field, which is responsible for granting other particles their mass. This field was first proposed in the mid-sixties by Peter Higgs - for whom the particle is named and his colleagues.
- The particle was finally discovered on July 4, 2012, by researchers at the Large Hadron Collider (LHC) - the most powerful particle accelerator in the world - located at the European particle physics laboratory CERN, Switzerland.

- A boson is a "force carrier" particle that comes into play when particles interact with each other, with a boson exchanged during this interaction. For example, when two electrons interact they exchange a photon - the force-carrying particle of electromagnetic fields.
- The Higgs boson's nickname "the God Particle" was solidified upon its discovery, namely as a result of the popular media.

Importance of Higgs Field

- This Higgs field played an absolutely decisive role in the first moments after the birth of the universe as it determines the very nature of the vacuum which fills our space-time.
- It makes the existence of matter and interactions as we know them possible, and it is responsible for the appearance of the mass of all known elementary particles.
- Without the Higgs field, and thus without the Higgs boson, there would just be no atomic elements, no stars, and no life in this universe.

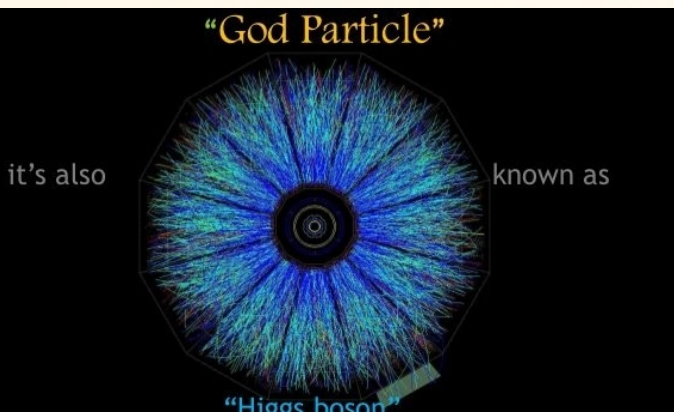
John L. 'Jack' Swigert Jr. Award

Why in the News?

- India's Chandrayaan-3 mission team was recently awarded the prestigious 2024 John L. 'Jack' Swigert Jr. Award for Space Exploration, acknowledging their efforts to elevate the standards of space exploration.

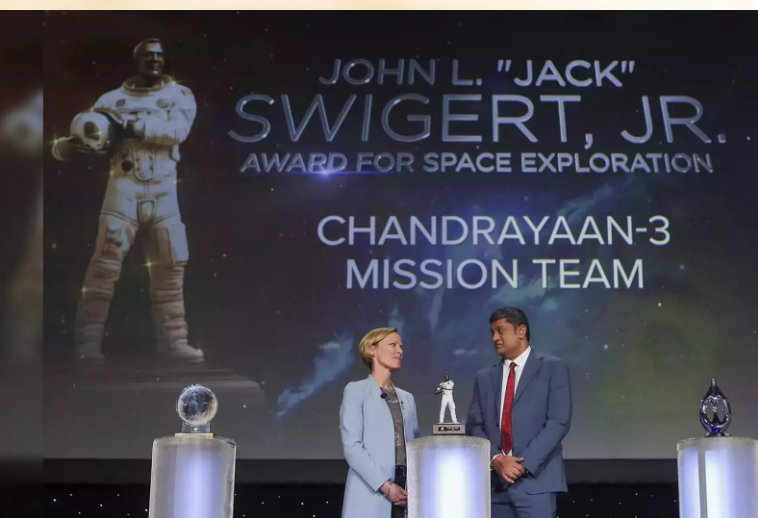
More About the News

- John L 'Jack' Swigert Jr. Award for Space Exploration is an honour bestowed by the United States' National Aeronautics and Space Administration (NASA) in recognition of outstanding contributions to space exploration.



- The Higgs boson has a mass of 125 billion electron volts - meaning it is 130 times more massive than a proton, according to CERN.
- It is also chargeless with zero spin a quantum mechanical equivalent to angular momentum. The Higgs Boson is the only elementary particle with no spin.

- It is named after John L. 'Jack' Swigert Jr., an American astronaut who flew on the Apollo 13 mission in 1970.
- Swigert played a critical role in the safe return of the Apollo 13 crew after an oxygen tank explosion aborted their planned lunar landing.
- With the successful Chandrayaan-3 mission in August last year, India became the first country to land on the south pole of the moon.



- The giant stride in lunar exploration of the south pole, was crafted by the Indian Space Research Organisation (ISRO), which 'broadens humanity's horizons in space exploration, opening up new realms for comprehension and collaboration,' as stated in a press release by the Space Foundation.
- The award was accepted by India's Consul General in Houston, D C Manjunath, on behalf of the ISRO at the inaugural event of the annual Space Symposium in Colorado.
- Comprising both the lander (Vikram) and the rover (Pragyan), India's lunar mission, Chandrayaan-3, successfully touched down on the southern pole of the Moon at 6:04 pm on August 23.
- With this achievement, India joined the ranks of the US, China, and the former Soviet Union as the fourth nation to demonstrate the capability of soft landing on the lunar surface.

Manoj Panda appointed as a member of 16th Finance Commission

Why in the News?

- The Centre has notified the appointment of economist Manoj Panda as a full-time member of the Sixteenth Finance Commission, tasked with formulating recommendations on the revenue sharing formula between the Centre and States for the five-year period beginning April 2026.

More About the News

- The Government had constituted the Finance Commission on December 31, 2024 and named former NITI Aayog vice chairman and Columbia University professor Arvind Panagariya as its chairman.
- Other members of the Commission are Ajay Narayan Jha, Annie George Mathew and Soumya Kanti Ghosh.
- Panda's research areas span monitoring and analysis of macro-economic trends and prospects, evaluation of alternative trade and fiscal policy options from the point of view of growth and distribution.

About Finance Commission

- The Finance Commission is constituted by the President under Article 280 of the Constitution, mainly to give its recommendations on distribution of tax revenues between the Union and the States and amongst the States themselves.
- The primary responsibility of the finance commission is to assess the Union and State Governments' finances, suggesting tax sharing between them, and establishing the



principles governing tax allocation among states.

- According to the recommendation of the 15th Finance Commission, the share of states in the central taxes for the 2021-26 period is recommended to be 41%, same as that for 2020-21.
- This is less than the 42% share recommended by the 14th Finance Commission for 2015-20 period. The adjustment of 1% is to provide for the newly formed union territories of Jammu and Kashmir, and Ladakh from the resources of the centre.

Indian Meteorological Department (IMD) conducts Pre-Cyclone Exercise

Why in the News?

- Indian Meteorological Department (IMD) conducted Pre-Cyclone Exercise for the season April-June 2024 under the Chairmanship of Dr. Mrutyunjay Mohapatra, Director General of IMD on 10th April in Hybrid mode at Mausam Bhavan, New Delhi.



More About the News

- The Exercise was a part of biennial exercise conducted Pre-cyclone Season And post-Cyclone season to take stock of preparedness of various stakeholders in disaster management.
- India has one of the best early warning system and weather forecasting model.
- IMD has developed an indigenous 'Decision Support System' with an increased accuracy

of more than 50% as compared to predictions in the last decade.

- Also shared that a Multimodal ensemble system in being deployed to continuously monitor the weather changes and accordingly issue location specific advisories.

About Indian Meteorological Department (IMD)

- The India Meteorological Department (IMD) was established in 1875.
- It is the National Meteorological Service of the country and the principal government agency in all matters relating to meteorology and allied subjects.
- The India Meteorological Department (IMD) monitors the development of tropical cyclones in its area of responsibility and provides advisory information to ICAO, DGCA, Meteorological Watch offices in the country and neighbouring countries as well.
- As IMD is celebrating the 150th year of its establishment and service to the nation, IMD is ready to scale new heights and reach out to each and every household with weather information at anytime and anywhere "HAR HAR MAUSAM and HAR GHAR MAUSAM" with state-of-art technology and collaboration of academia, R & D institutes, public private partnership and stakeholders.

QS World University Rankings 2024

Why in the News?

- The 2024 edition of Quacquarelli Symonds (QS) World University Ranking by Subject 2024 was released recently featuring the world's top universities that are leading in various parameters.

More About the News

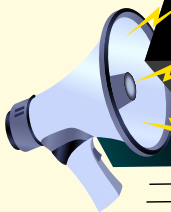
- The QS rankings, released on Wednesday, April 10, showed that Jawaharlal Nehru University (JNU) in Delhi is the highest-ranked university in India. JNU is in the 20th position globally for development studies, according to the London-based higher education analytics company.

- The next two highest ranked universities in these tables are IIM Ahmedabad, debuting in the 22nd position for Business and Management Studies, while Saveetha Institute of Medical and Technical Sciences (deemed to be university) secured the 24th spot globally in Dentistry and is the only Indian university to achieve a perfect score (100/100) in one of the QS indicators, namely the H Index, ranking number one in this metric, within the Dentistry table.
- Sixty-nine Indian universities made it to the rankings with 424 entries in the 2024 QS World University Rankings by Subject. This marks a 19.4 per cent rise from the previous year's 355 entries.
- 72 per cent of the Indian entries this year are either new to the list, have shown improvement, or have maintained their positions, whereas a mere 18 per cent experienced a decline. Overall, India has

demonstrated a significant 17 per cent year-on-year improvement.

- IIT Guwahati has been named as one of the world's top universities for the study of Data Science and Petroleum Engineering subjects, securing a global ranking of 51-70, and Petroleum Engineering, where it ranks 51-100 globally.
- One of the biggest challenges faced by India is educational – providing high-quality tertiary education in the face of exploding demand: this much was recognized by 2020's NEP (National Education Policy), which set the ambitious target of a 50% gross enrolment ratio by 2035.
- While there is still a lot of work to be done to improve standards, access to higher education, universities' digital readiness and global competitiveness, it is clear that India is taking significant steps in the right direction.

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