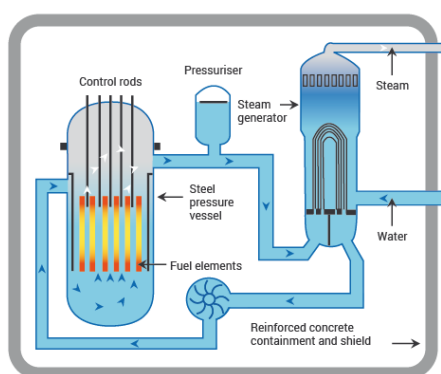


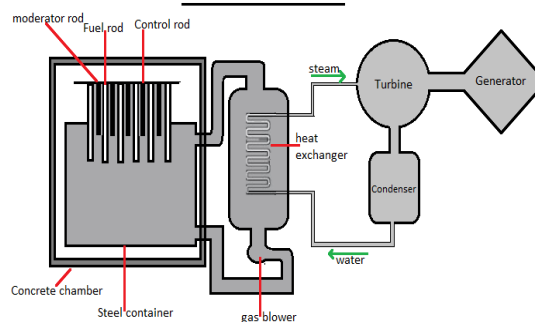
Zaporizhzhia

What is the reactor design?

- The Zaporizhzhia NPP is located southwest of Zaporizhzhia city, along the Dnieper River.
- It has six VVER-1000 reactors for a total power generation capacity of 6 GW.
- The reactor complex consists of the reactor vessel, in which uranium dioxide fuel rods are immersed in water and control rods are inserted at the top.
- The water is both coolant and moderator.
- A pressurizer holds the water at high but constant pressure around 150 atm to prevent it from boiling



Nuclear Reactor



What is the risk at Zaporizhzhia?

- The principal danger here is that the primary circuit water could depressurize as steam and escape into the air, along with radioactive material and other volatile substances.
- This mixture will contain the isotope iodine-131, which is easily dispersed by winds and accumulates in and damages the thyroid gland in humans.
- It has a half-life of around eight days and so, per the report, “would only pose a threat for several weeks”.
- A breach and depressurization would also release caesium-137, which has a half-life of 30 years and was responsible for contaminating much of Chernobyl’s surroundings after the accident

THE HINDU

Iran as sco member

- As Alran joins the Shanghai Cooperation Organisation (SCO) as its ninth member, leaders of the SCO at a virtual summit chaired by Indian Prime Minister Narendra Modi on July 4 stressed that the formation of a “more representative” and multipolar world order is in the global interest.

What is the SCO?

- The SCO was built on the ‘Shanghai Five’ grouping of Russia, China, Kazakhstan, Kyrgyzstan, and Tajikistan, which had come together in the post-Soviet era in 1996, in order to work on regional security, reduction of border troops, and terrorism.
- In 2001, the Shanghai Five inducted Uzbekistan into the group and named it the SCO.
- The organization has two permanent bodies the SCO Secretariat based in Beijing and the Executive Committee of the Regional Anti-Terrorist Structure in Tashkent

What are the main goals of the SCO?

- The SCO describes its main goals as: “strengthening mutual trust and

neighborliness among the member states; promoting their effective cooperation in politics, trade, economy, research and technology, and culture...

- Making joint efforts to maintain and ensure peace, security, and stability in the region; and moving towards the establishment of a democratic, fair, and rational new international political and economic order.”

- The latter part of the statement which calls to build a “new international political and economic order” did not sit well with the U.S. and Europe, and has led to the SCO being dubbed as “anti-NATO” for proposing military cooperation

- India and Pakistan joined the SCO as observers in 2005 and were admitted as full members in 2017. Since 2014, India and Pakistan have cut all ties, talks, and trade with each other

- Not only Pakistan, the SCO has also facilitated talks between India and China on the Line of Actual Control (LAC) border issue

IMPORTANCE OF IRAN

- For India, which has built its connectivity strategy through Iran’s Chabahar port, where it operates a

terminal, and through the International North-South Transport Corridor that goes through Iran and Central Asia to Russia, the entrance of Iran into the SCO is an important milestone.

- To begin with, Iran's presence ensures support for New Delhi's moves to circumvent land-based trade through Pakistan, which has blocked transit trade for India.
- Uzbekistan President Shakta Mirziyoyev said that Central Asian states that are double land-locked will seek to build a multimodal trade route via Afghanistan to ports in both Pakistan and Iran.
- It also allows India to conduct trade with the region while staying out of China's Belt and Road Initiative.
- In addition, the induction of Iran, a historically close partner of India that has also suffered from terrorism emanating from Pakistan and Afghanistan will bolster India's push for an end to terror safe havens.
- Where the government may find some unease in more vocal support for Iran is in the fact that the SCO is increasingly seen as an "antisweat" forum, and Iran, like Russia is under

severe sanctions.

- In addition, the U.S. has accused Iran of supplying weapons to Russia, and the expected induction of Belarus next year will only strengthen this image of the SCO, even as India strengthens ties with the Quad, making the Indian balancing act more difficult.

THE HINDU

Smart bandage

What is a smart bandage?

- "Chronic non-healing wounds affect tens of millions of people around the world and cause a staggering financial burden on the health care system.
- The device, built in Dr. GAO's lab, is assembled on a soft, stretchable polymer that helps the bandage maintain contact with and stick to the skin.
- The bioelectronics system consists of biosensors that monitor biomarkers in the wound exudate.
- Data collected by the bandage is passed to a flexible printed circuit board, which relays it wirelessly to a smartphone or tablet for review by a physician.

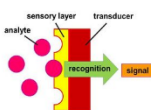
- A pair of electrodes control drug release from a hydrogel layer as well as stimulate the wound to encourage tissue regrowth
- Biosensors determine the wound status by tracking the chemical composition of the exudates, which changes as the wound heals.
- A pair of electrodes the same electrodes that stimulate the tissue control the release of drugs from a hydrogel layer

Biosensors

Definition

➤ An analytical device, which is a combination of biological component with a physicochemical detector used for the sensing an analyte (biological samples)

➤ Converts biological response into electrical signals

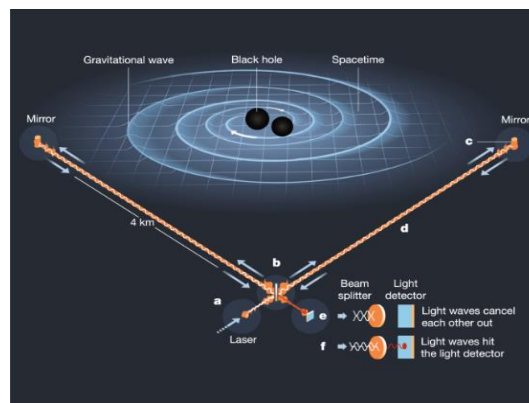


THE HINDU

Gravitational waves

- Last week, scientists reported evidence that the universe is constantly flooded with low-frequency gravitational waves, unlocking a hitherto unexplored avenue to expand our knowledge of the cosmos.
- Albert Einstein's theory of relativity predicted the existence of gravitational waves more than a

century ago but the phenomenon was only directly observed in 2016.



- Gravitational waves are like ripples in the fabric of spacetime, akin to tiny waves on a lake when a pebble is tossed into it.
- In 2016, scientists working with the Laser Interferometer Gravitational-wave Observatory (LIGO) announced that they had directly detected gravitational waves for the first time, emitted by the merger of two black holes 1.3 billion light years away
- Indirect evidence of the existence of gravitational waves had been discovered in 1974 itself, from the decaying orbital period of objects called binary pulsars, by Russel Hulse and Joseph Taylor
- New discovery India's Giant Metre wave Radio Telescope was one of six large telescopes worldwide involved in collecting data that led to the recent discovery.

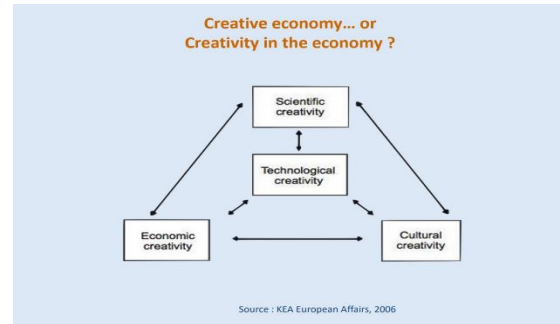
- The information carried by gravitational waves can allow scientists and researchers to analyze parts of the universe that are difficult to observe in any other way.
- Historically, scientists have used electromagnetic radiation (in the form of visible light, X-rays, microwaves, ultraviolet light, etc.) to study the universe.
- Gravitational waves offer a kind of information that electromagnetic radiation doesn't, however. Intense cosmic events like the collisions of black holes or neutron stars release large amounts of energy as well as gravitational waves.

THE HINDU

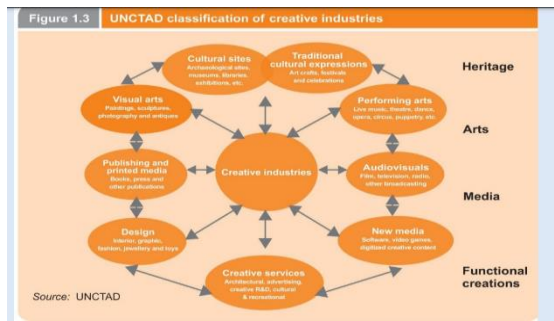
Creative economy

What is the creative economy?

- The creative economy has no single definition. It is an evolving concept that builds on the interplay between human creativity and ideas and intellectual property, knowledge, and technology.
- Essentially it is the knowledge-based economic activities upon which the 'creative industries' are based.



- The creative industries which include advertising, architecture, arts and crafts, design, fashion, film, video, photography, music, performing arts, publishing, research & development, software, computer games, electronic publishing, and TV/radio are the lifeblood of the creative economy.
- They are also considered an important source of commercial and cultural value.
- The creative economy is the sum of all the parts of the creative industries, including trade, labor and production.
- Today, the creative industries are among the most dynamic sectors in the world economy providing new opportunities for developing countries to leapfrog into emerging high-growth areas of the world economy.



Concluding Remarks

- No common definition of the creative economy
- Nor consensus about a unique classification for creative industries
- No one-fits-all recipe but strategic choices to be made by governments
- The creative economy offers new venues for developing countries to leapfrog into high-growth areas of the world economy
- Strategic vision and long-term plans are essential to foster the creative economy
- National policies should be based on local strengths, weakness and realities
- Creativity and innovation are the core of socio-economic transformation

Creative economy is not a panacea but a feasible development option

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