

Blue Walker 3 satellite

Impact of the prototype Blue Walker 3 satellite on astronomy.

The Blue Walker 3 is a prototype satellite, part of a satellite constellation planned by its owner AST Space Mobile, intended to deliver mobile or broadband services anywhere in the world.

Observations of Blue Walker 3 showed it was one of the brightest objects in the night sky, outshining all but the brightest stars,

Several companies around the world have envisaged such satellite constellations

However, owing to their location closer to the earth location and relatively large size, their potential to disrupt night sky observations is higher, which is why astronomers are raising concerns around these constellations, or groups of satellites.



The Hindu

State population and political and economic significance

Article 81 of the Indian Constitution stipulates that Lok Sabha constituencies in the country should be equal by the size of population.

Based on the 1971 Census, the number of Lok Sabha constituencies for States was determined and frozen for the next 25 years through

Current Affairs 5th October 2023 by Saurabh Pandey

the 42nd Amendment Act 1976.

In 2001, through the 84th Amendment Act, the freeze on the number of constituencies for each State was further prolonged until the first Census after 2026.

The population growth rates differ between the non-Hindi speaking southern States and the Hindi-speaking northern States.

Between 1971 and 2011, the proportion of the population of Bihar, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, Rajasthan, Uttarakhand and Uttar Pradesh increased from 44% to 48.2%, whereas the proportion of population of the five southern States (Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Telangana) declined from 24.9% to 21.1%.

If equal size of Lok Sabha constituencies by population is enforced today as in the population projections of 2023, the five

southern States will lose 23 seats, while the northern States will gain 37

The attempt to equalize the size of constituencies by population is based on the dictum, "One Person, One Vote".

In a 'First- Past- the -Post' election system, along with a multi-party contest, voters know that only one of the contestants shall win, that is, the winner takes all.

Often, winners are elected even with less than one- third of the votes polled

When family planning and population control are the stated policies of the national and regional governments in India, States that have implemented these policies and effectively controlled their population should not be penalised through reduced political representation in subsequent periods.

Population control happens not only

Current Affairs 5th October 2023 by Saurabh Pandey

due to the implementation of family planning programmes but also because of the social change that is engineered by the leaders in the society.

Role of population in fiscal transfers

Once in five years the Union government constitutes a Finance Commission to recommend, among other things, the share of each State in the assigned tax revenue of the Union government.

Every Finance Commission recommends a formula for the horizontal distribution of the Union government's tax revenue among the States.

Population and per capita income of a State are considered to be two important indicators that are always included in the distribution formula with larger weights.

The terms of reference of the Fifteenth Finance Commission openly declared taking the 2011

population in the distribution formula.

With this, the southern States lost the advantage of getting some financial rewards for population control.

Therefore, the southern States have already started facing reduced financial transfers from the Union government as a reward for controlling population growth.

There is another factor that consistently brings in the current population in the distribution formula the per capita income of a State.

The per capita income of a State is considered as a proxy for its ability to raise its own revenue.

The higher the per capita income of a State, the lower its share in the Union tax revenue.

Lower per capita income of a State may be due to higher population for

a given Gross State Domestic Product.

Therefore, the higher the current population of a State, the higher its share in the Union tax revenue.

It is important to note that usually the per capita income is assigned larger weight in the distribution formula favouring the northern States.

The Hindu

Climate 'polycrisis'

The climate 'polycrisis' a term made popular by Adam Tooze refers to the interconnected and compounding crises related to climate change that are affecting the planet not just in a few sectors but across several sectors and domains.

It encompasses the physical impacts of climate change (rising temperatures, sea-level rise, and extreme weather events) and the social, economic, and political

challenges that arise from these impacts.

In India, one can see the interconnections between seemingly different sectors such as energy, infrastructure, health, migration and food production that are being impacted by climate change.

Recognizing the complexity and interconnectedness of the climate polycrisis, it is crucial in developing a holistic approach that takes into account the diverse perspectives and priorities of different stakeholders, while ensuring resilience, equity, and justice

A national carbon accounting (NCA) system is both an evolutionary and a revolutionary generalization of these ideas.

It will bring the entire nation, starting from individuals and households, under one carbon accounting framework. This will be a

Current Affairs 5th October 2023 by Saurabh Pandey

paradigmatic change in the way we look at all human and non-human “activities” in the world

An NCA will bring the concept of carbon books to the nation and will make it mandatory for businesses and individuals to declare/report their carbon inflows and outflows

An NCA will not only help India meet its commitment to becoming net zero by 2070 but also help it and other countries (if adopted globally) create new livelihoods and new forms of organizing its economy and society.

Everyone understands GDP growth and, more recently, alternative measures such as Gross National Happiness.

The Hindu

Nobel prize in chemistry- quantum dots

The Nobel Prize in Chemistry was awarded on Wednesday to Mounqi

G. Bawendi, Louis E. Brus and Alexei I. Ekimov for being pioneers of the Nano world.

The Nobel Laureates in Chemistry 2023 have succeeded in producing particles so small that their properties are determined by quantum phenomena.

The particles, which are called quantum dots, are now of great importance in nanotechnology,”

These tiny particles have unique properties and now spread their light from television screens and LED lamps.

They catalyze chemical reactions and their clear light can illuminate tumors tissue for a surgeon.

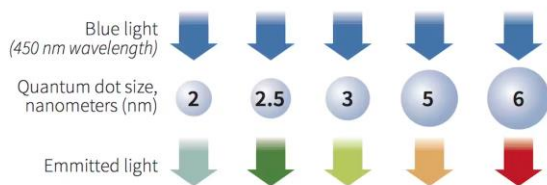
Quantum dots, also called semiconductor nanocrystals, are semiconductor particles a few nanometers in size, having optical and electronic properties that differ from those of larger particles as a result of quantum mechanical

effects.

They are a central topic in nanotechnology and materials science.

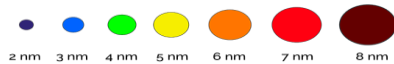
What are quantum dots

Tiny man-made crystals that have the ability to convert a spectrum of light into different colours

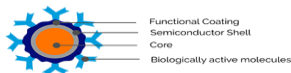


Quantum Dots

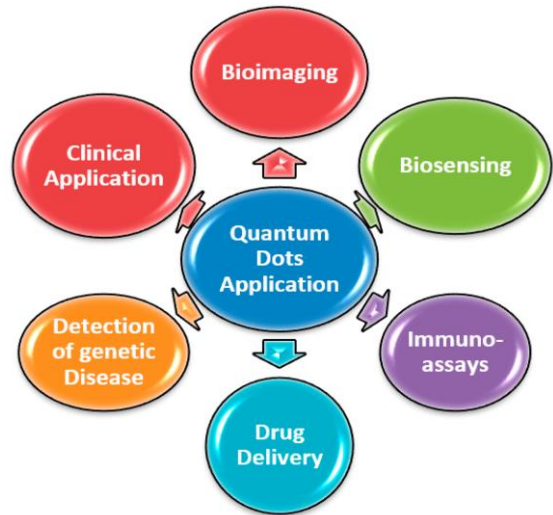
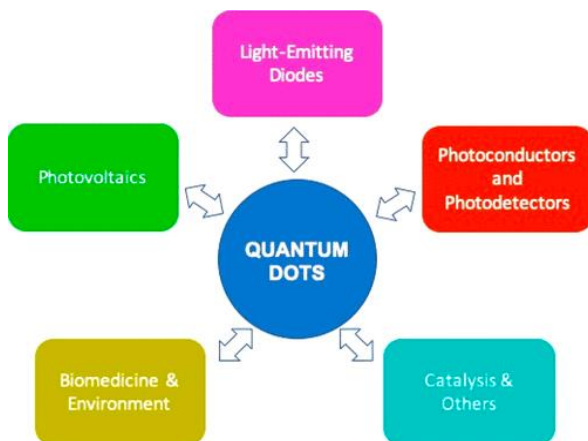
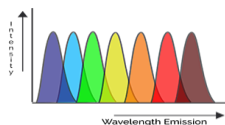
1. Quantum dots of different sizes emit light of different wavelengths. This is due to quantum confinement.



2. Quantum dots contain a core of clusters of semiconductor atoms often coated with an additional semiconductor shell. An outer functional polymer or lipid coating then allows coupling to proteins, oligonucleotides, antibodies or other molecules of interest.



3. Quantum dots absorb photons of light and then re-emit longer-wavelength photons within a narrow waveband. They are brighter than fluorescent dyes and more stable over time.



Conservation of Foreign Exchange and Prevention of Smuggling Activities Act (COFEPOSA) Act, 1974. Though MISA was repealed in 1978, this law is still in force. COFEPOSA Act 1974 prescribes that the appropriate government shall establish advisory boards to assist the government on matters related to the detention of persons and prepare reports regarding the same. According to this section, the appropriate Government shall form an advisory board to perform the functions mentioned in clauses (4)(a) and (7)(c) of Article 22.

The Hindu

Cabomba furcuta

Popularly called as Pink Bloom due to its massive flowering.

The submerged perennial aquatic plant grows in stagnant to slow-flowing freshwater. The fast growing Cabomba is a visual treat but becomes a potential outspread in water bodies by active stem propagation, hindering penetration of light into the water.

Cabomba, which requires a large quantity of oxygen for its growth, will choke water bodies and drainage canals. It causes decline in diversity of native aquatic plants and causes economic losses by affecting yield of freshwater fishes. The key to controlling the species is to mechanically remove them from the waterbody and dry them in terrestrial spaces, the team notes.

The Hindu
