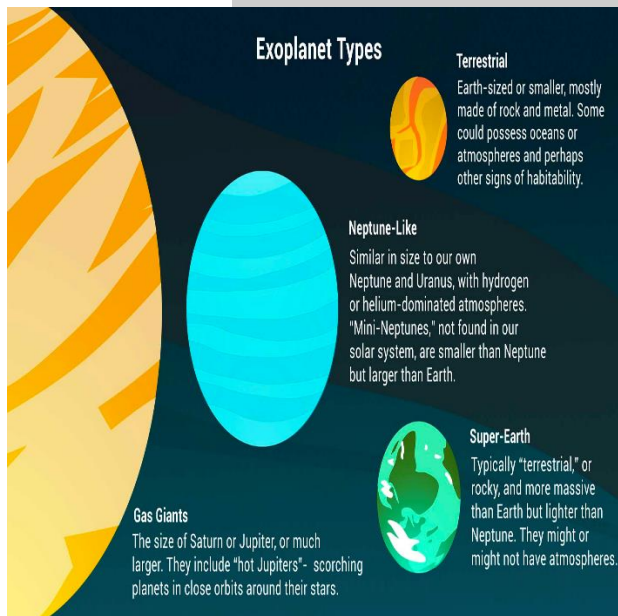


Bright star (HD 110067)

- Six exoplanets orbiting around a nearby bright star (HD 110067) in the Coma Berenices constellation has been discovered. ‘
- The planets have radii between that of Earth and Neptune.



- Observations of HD 110067 made by NASA's Transiting Exoplanet Survey Satellite (TESS) in 2020 and 2022 revealed several dips in the star's brightness, and with additional observations from the 'Characterizing Exoplanets Satellite' (CHEOPS) the signals were interpreted as six planets passing in front of the star

- HD 110067 is the brightest star found to host more than four transiting exoplanets to date, the authors note, and add that more planets may exist within or beyond the temperate zone, although such observations have not been made so far.

- They conclude that the HD 110067 system offers a chance to learn more about sub Neptune's and how systems in this configuration might form.

- Planets with radii between that of the Earth and Neptune (referred to as 'subNeptunes') are found in close in orbits around more than half of all Sunlike stars, but details of their composition, formation and evolution are not well understood.
- HD 110067 is a bright star in the Coma Berenices constellation (around 100 light years away), which is visible from Earth's Northern Hemisphere.

FROM BASICS TO UPSC BRILLIANCE
The Hindu

Chinstrap penguin



Current Affairs 3rd December 2023 by Saurabh Pandey

- In the wild, nesting chinstrap penguins get more than 11 hours of sleep per day but not all at once.
- According to a study, these birds nod off thousands of times per day, but for only four seconds at a time, cumulatively accruing their daily sleep needs while remaining continuously vigilant over their nests.
- the findings suggest that, given the breeding success of these penguins, the benefits of sleep can accrue incrementally and those micro sleeps can fulfil at least some of the benefits of longer sleep bouts.

• About chinstrap penguin

The chinstrap penguin (*Pygoscelis antarcticus*) is a species of penguin that inhabits a variety of islands and shores in the Southern Pacific and the Antarctic Oceans.

- Its name stems from the narrow black band under its head, which makes it appear as if it were wearing a black helmet, making it easy to identify.
- Other common names include ringed penguin, bearded penguin, and stone cracker penguin, due to its loud, harsh call.

- Chinstrap penguins have a circumpolar distribution.
- They breed in Antarctica, Argentina, Bouvet Island, Chile, the French Southern Territories, and South Georgia and the South Sandwich Islands.
- Vagrant individuals have been found in New Zealand, the islands of Saint Helena and Tristan da Cunha, and South Africa.

• The Hindu

M dwarf star LHS 3154 / mTORC1

- The discovery of a Neptune mass exoplanet orbiting the very low mass M dwarf star LHS 3154 challenges theoretical models of planet formation, according to a new study.
- The planet, which has a mass at least 13 times that of Earth, tightly orbits a star nine times less massive than the Sun, demonstrating that small stars can sometimes host larger planets than was previously thought.
- Although massive planet candidates have been detected around a few very low mass dwarfs
- Bacillus Calmette-Guerin (BCG)
- Scientists have uncovered a molecular mechanism that limits the

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abnormal growth of new blood vessels.

- Their results show that the mechanism limits blood vessel growth by restraining the size of endothelial cells and the activity of the mTORC1 signalling pathway.
- Angiogenesis, the development of new blood vessels, is important during tissue development and to restore blood flow to tissues that have been injured or are starved of oxygen.

mTORC1

- mTORC1 integrates signals from multiple growth factors, nutrients, and energy supply to promote cell growth when energy is sufficient and catabolism when the body is hungry.
- mTORC1 mainly regulates cell growth and metabolism, while mTORC2 mainly controls cell proliferation and survival.

The Hindu

Health and COP 28

- Bacillus Calmette-Guerin (BCG) is the live attenuated vaccine form of Mycobacterium bovis used to prevent tuberculosis and other mycobacterial infections.

- The vaccine was developed by Calmette and Guerin and was first administered to human beings in 1921.

- BCG is the only vaccine against tuberculosis.

- It is the most widely administered vaccine and usually a part of the routine newborn immunization schedule.

- BCG vaccine also offers protection against non-tuberculous mycobacterial infections like leprosy and Buruli ulcer.

- This activity reviews the mode of action of the BCG vaccine and highlights the role of the inter professional team in educating patients about tuberculosis prevention.

Health and COP 28

- The 'groundbreaking Health Day at COP28', as COP28 president Sultan Ahmed Al Jaber put it, is expected to pose two questions: how public health can become resilient to climate change, and who will finance this transformation.

- India also highlighted the intricate link between climate change and public health during the health talks held under its G20 presidency this year.

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- “Health Day in itself doesn’t necessarily mean that health will be reflected in the negotiations.
- “The connection between health and climate change is evident, yet it has not been a specific focus of the COP process until now.
- The United Nations Framework Convention on Climate Change (UNFCCC) recognizes the health impacts of climate change.
- The COP28 UAE Declaration on Climate and Health includes dialogue on mitigating emissions, health sector adaptation to climate change, mainstreaming of health into climate policies and the sticky question of climate financing for health.
- The Declaration, however, doesn’t mention fossil fuels. It recognizes the need for climate mitigation, “strengthening research on the linkages between environmental and climatic factors and antimicrobial resistance”;
- and “intensifying efforts for the early detection of zoonotic spillovers” to prevent future pandemics.
- It does not mention pollution related harms or identify ‘fossil fuels’ coal, oil and gas as a driver of health threats, or emphasizes the need to end fossil fuel dependence.
- Fossil fuels are seen as the largest contributor to global climate change
- Changing weather patterns and rising temperatures are altering the life cycle of vector borne diseases such as dengue and malaria, which disproportionately impact poorer, marginalized groups (the spread of dengue has increased in India over the last two decades, research shows).
- Then there is the matter of finance.
- Health crises triggered by warming climate are expected to chart a financial toll of around \$24 billion annually by 2030.
- Another estimate shows that 40% of climate related poverty would be due to direct health impacts, as people’s income, productivity and health costs would soar.
- The Green Climate Fund, the Asian Development Bank, the Global Fund and Rockefeller Foundation pledged a new \$1 billion finance pledge for climate and health.
- “This \$1 billion sum is a tremendous addition to current levels of climate and health finance,”.
- “It is also key that funding for climate and health be truly new and additional, and not pulled from other

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key areas...that are vital to protecting health, such as water and sanitation, food security, and humanitarian action.”

- Developing countries had earlier asserted the need for grant based international public finance that doesn't add to their debt burden.
- However, the Declaration endorses climate health funding from “domestic budgets, multilateral development banks, multilateral climate funds...”, along with philanthropies and private sector actors.

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