

1. India-US Science and Technology Forum (IUSSTF)

Why in News?

- India-US Science and Technology Forum (IUSSTF) was recently established under an agreement between the Governments of India and the United States of America in 2000.

About:

- It is an autonomous bilateral organization jointly funded by both the Governments that promote Science, Technology, Engineering, and Innovation through substantive interaction among government, academia, and industry.
- Its vision is to ensure excellence in Science, Technology and Innovation space through collaborative initiatives between India and the United States of America.
- Its mission is to act as a catalyst to promote long-term scientific collaborations between India and the U.S. through partnerships amongst individual scientists, scientific institutions and the scientific community at large.
- The nodal departments for this program are the **Department of Science & Technology (DST), Governments of India, and the U.S. Department of State.**

Other Important Programs

- The **Fulbright program**, which offers international educational and cultural exchange programs.
- The **Higher Education Dialogue**, which laid out the road map for promoting strategic institutional partnerships, deepening collaboration in research and development, fostering partnerships in vocational education and focusing on junior faculty development.
- **Global Initiative of Academic Networks (GIAN)** is launched by India, under this upto 1000 American academics will be invited and hosted each year to teach in Indian universities at their convenience.

2. Lipids

Why in News:

- Recently, researchers at IIT-Bombay are using biologically active lipid molecules as chemical biology tools to understand their biological disease-causing function. They are using lipids from *Mycobacteria tuberculosis* (Mtb).

About Lipids:

- They are molecules that contain hydrocarbons and make up the building blocks of the structure and function of living cells.
- They are responsible for maintaining the integrity of our cell membrane, which allows nutrients and drugs to pass through the cell.
- They play a major role in altering properties of the cell membrane.

Role of lipids in Infectious Diseases:

- It plays a critical mechanisms involved in host-pathogen which is being explored.
- It represents a golden opportunity to deepen the understanding of the function of Mtb lipids in membrane-dictated bacterial survival, pathogenesis, and drug resistance.
- Scientists are also investigating the role of Mtb lipids in
- drug-membrane interactions, underscored by the fact that lipids critically dictate the molecular interactions of drugs with membranes influencing drug diffusion, partitioning, and accumulation.
- The Membrane structures specific to **mycobacterial lipids** have also been developed which can act as 'cell-free' platforms for anti-tubercular (relating to TB) drug interactions.

Significance:

- It helps in Investigating antibiotic interactions with mycobacterial (causative agent of Tuberculosis) specific membranes for future antibiotic design.
- It helps in Shaping the effectiveness of already existing anti-TB drug molecules and fostering development of new ones.

3. National Aquifer Mapping and Management program (NAQUIM)

Context:

- National Aquifer Mapping and Management program (NAQUIM) is recently seen in news.

About National Aquifer Mapping and Management Program (NAQUIM):

- It is being implemented by the Central Ground Water Board (CGWB). It envisages mapping of aquifers (water bearing formations), their characterization and development of Aquifer Management Plans to facilitate sustainable management of groundwater resources.

- It was initiated as a part of the Ground Water Management and Regulation Scheme to delineate and characterize the aquifers to develop plans for ground water management.
- **Ground Water Management and Regulation Scheme** is a Central Sector Scheme of the Department of Water Resources, River Development & Ganga Rejuvenation.

About Central Ground Water Board:

- It is a subordinate office of the Ministry of Water Resources and is the National Apex Agency.
- It entrusted with the responsibilities of providing scientific inputs for management, exploration, monitoring, assessment, augmentation and regulation of groundwater resources of the country.
- It was established in **1970** by renaming the Exploratory Tube wells Organization under the Ministry of Agriculture, which later on merged with the Groundwater Wing of the Geological Survey of India during 1972.

4. World Consumer Day

Why in News?

- Recently, the Ministry of Consumer Affairs observed the World Consumer Day by organizing a webinar on, **‘The Sustainable Consumer’**.

About:

- **15th March** is celebrated as World Consumer Rights Day, every year. However, India celebrates **24th December** as National Consumer Day every year.
- On this day the Consumer Protection Act, 1986 had received the assent of the President and came into effect.
- The **webinar** is organized in place of a physical event to maintain social distancing in the wake of COVID19 pandemic.
- The theme for 2020 is ‘The Sustainable Consumer’. It aims to focus on the need for sustainable consumption globally, as well as highlighting the important role that consumer rights and protection can play.
- It **Objectives** signifies solidarity in the international consumer movement, demanding that consumer rights are to be respected and protected. The event also gives a chance to protest against the market abuses and social injustices which undermine those rights.

5. Indo-U.S. Science and Technology Forum

Why in News?

- Indian students will undertake a research internship at Viterbi School of Engineering, University of Southern California, LA, USA under the IUSSTF Program.

IUSSTF:

- IUSSTF is an acronym for the Indo-U.S. Science and Technology Forum.
- It is established under an agreement between the Governments of India and the USA in March 2000. It is an autonomous bilateral organization jointly funded by both the Governments that promote Sci-Tech, Engineering and Innovation through substantive interaction among government, academia and industry.
- The Department of Science & Technology, Governments of India and the U.S. Department of States are respective Nodal Departments.

Viterbi Program:

- The Viterbi Program of IUSSTF was developed between IUSSTF and the Viterbi School of Engineering, University of Southern California (USC).
- This program is a part of the Government's endeavour to encourage research and development amongst the bright young Indian minds to create long-term, sustainable, and vibrant linkages between India and the US.

6. Identifying Rogue Drones

Why in News?

- IIT-Madras researchers have developed an electronic warfare model that could help the Armed Forces track down unregulated drones and secure air space.

Highlights:

- A 2019 report states that India reported over six lakh rogue drones of varying size and capacity, of which most of them were termed "potential threat".
- Ideally, law enforcement drones are used by Defence Forces and Intelligence Agencies for surveillance and rescue operations among other things.
- This is an electronic warfare model that could help the Armed Forces secure air spaces and track down unregulated drones.

- It 'hacks' into rogue drones and sends false GPS signals for communication. The target drone's GPS sensor would lock onto their fake radio station, which transmits signals at a much higher rate than the available one.
- In doing so, the drone generates fake GPS packets that are received by the enemy, thereby calibrating the rogue drones' latitude and longitude positions, when it enters the airspace.
- The drone will act as a GPS satellite. The rogue drone would think it is a legit source and would begin to communicate from this radio station. By this operation, we can change its latitude, longitude and altitude, and force them to land safely.
- The biggest advantage of the prototype lies in its ability to operate beyond the line of sight control, the upper limit being 400 feet altitude for drone operations. It can also intercept phone calls at 250 feet above ground level.

7. Undetected Cases Drive Spread in Community

Why in News?

- Eighty-six percent of people in China who were infected with novel coronavirus (SARS-CoV-2) were not tested in the two-week period before travel restrictions came into force on January 23 in Wuhan and other cities. And these undetected cases contributed to the majority of virus spread in the community, according to a study.

Highlights:

- The researchers used a computer model that draws on observations of reported infection and spread within China in conjunction with mobility data from January 10-23 and January 24-February 8.
- People who experienced mild, limited or no symptoms were not detected but spread the virus anyway.
- About half as infectious per person as a documented case who has more severe symptoms and maybe shedding more.
- Even though the undetected cases are only 55% contagious compared with those who exhibit severe symptoms and are detected, due to their greater numbers, they facilitated the rapid spread of the virus throughout mainland China. The undetected cases were the source of infection for 79% of documented cases.

-
- The undocumented infections which tend to be milder are distributing the virus broadly. They're contributing essentially to what is called self-transmission of the virus because it's really undetected and it's flying below the radar.
 - The modelling study suggests that a "radical increase" in identifying and isolating people who have not been tested yet would be needed to fully control the spread of the virus.
 - The paper says that steps taken by many individuals and governments to restrict travel, shut down schools, prevent large gatherings, isolation of suspected cases, and the use of face mask and regular handwashing could have helped slow down the spread of the virus. And some countries have also started community testing.
 - The authors say that while travel restrictions and other control measures could have reduced the spread of the virus in the community, the study does not provide evidence that such control measures would be sufficient to end the spread locally and prevent a rebound once travel and other restrictions are removed or relaxed.
 - The paper concludes by saying that there are already four coronavirus strains that are circulating in the human population. And if the novel coronavirus follows the pattern of H1N1, then it would spread globally and become the fifth coronavirus to become endemic in the human population.