Prelim Bits 12-11-2018

Supercomputer

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- The world’s largest supercomputer designed to work in the same way as the human brain has been switched on for the first time.
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- **SpiNNaker machine** – Spiking Neural Network Architecture is capable of completing more than 200 million million actions per second, with each of its chips having 100 million transistors.
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- It is designed and built in The University of Manchester in the UK.
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- In real time, it can model more biological neurons (basic brain cells in the nervous system that communicate by pure electro-chemical energy) than any other machine on the planet.
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- **SpiNNaker Vs Traditional computers -** Traditional computers communicate by sending large amounts of information from point A to B via a standard network.
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- Whereas SpiNNaker mimics the massively parallel communication architecture of the brain, sending billions of small amounts of information simultaneously to thousands of different destinations.
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- **Uses** – It will help neuroscientists better understand how our own brain works.
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- It also has simulated a region of the brain called the Basal Ganglia - an area affected in Parkinson’s disease.
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- Thus it has massive potential for neurological breakthroughs in science such as pharmaceutical testing.
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- Its power has recently been used to control a robot the spOmnibot, which uses the SpiNNaker system to interpret real-time visual information and navigate towards certain objects while ignoring others.
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GSAT – 29

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- ISRO is planning to put communication satellite GSAT – 29 from Sriharikota.
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- GSAT – 29 is a 3,500 kg communication satellite for providing high quality internet services.
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- It is one of the planned Indian HTS (High Throughput Satellites) quartet. HTS are sent out to provide improved and faster internet connectivity.
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- It will be launched by GSLV –MKIII – D2, which is a three stage (Solid- Liquid – Cryogenic) heavy lift launch vehicle.
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- It is designed to carry 4 ton class of satellites into Geosynchronous Transfer Orbit (GTO) or about 10 tons to Low Earth Orbit (LEO), which is about twice the capability of GSLV Mk II.
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- It will inject the GSAT – 29 satellite into GTO with required inclination to the equator.
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- The satellite will be placed in its final Geostationary Orbit (GEO) using the onboard propulsion system.
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- The lifespan of the satellite is 10 years.
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- It is the second test flight of GSLV –MkIII-D2 carrying the satellite.
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Tissue Chips in Space

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- It is an initiative by NASA to better understand the role of microgravity on human health.
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- Under this, NASA is planning to send small devices containing human cells in a 3D matrix known as “tissue chips or organs-on-chips” to the International Space Station (ISS).
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- It is to test how they respond to stress, drugs and genetic changes.
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- Tissue chips is made of flexible plastic with ports and channels to provide nutrients and oxygen to the cells inside them.
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- It is expected to behave much like an astronaut’s body, experiencing the same kind of rapid change.
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Mission Venus

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- ISRO has opened up for its “Mission Venus” seeking experiment ideas from space agencies, universities and researchers.
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- It is planned to be launched in Mid-2023.
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- It plans to study the planet from an elliptical orbit that is closest to Venus at 500 km and 60,000 km at the farthest end.
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- It is currently being handled by the Space Science Programme Office.
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- If the project is approved would be ISRO’s third interplanetary mission after Chandrayaan – 1 and Mars Orbiter Mission.
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National Monogenic Diabetes Study Group

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- It is a national body which has been recently setup to identify cases of monogenic diabetes across the country.
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- Monogenic diabetes is a group of disorders where mutation of a single gene causes diabetes.
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- The three commonest forms of it - Maturity Onset Diabetes of the Young (MODY), Neonatal Diabetes Mellitus (NDM) and Congenital Hypoglycaemia.
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- The study group has been formed with Madras Diabetes Research Foundation (MDRF) as a nodal center.

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- Under this initiative, MDRF would provide guidelines to the collaborators for identifying monogenic diabetes.
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- **Critical groups to be assessed** - Children below six months of age and those diagnosed as Type 1 diabetes but have atypical features such as milder forms of diabetes, and strong family history of diabetes going through several generations.
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Source : The Hindu

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