

### **RH300 MkIII ,SVALBARD**

- On November 20, 1997, a Rohini RH-300 Mk-II sounding rocket rose to the skies from Svalbard, Norway, operationalizing a new rocket launching range there.
- The solid propellant- powered rocket was shipped from India for the launch,
- The RH-300 Mk-II was given a new name by the NSC (Norwegian Space Centre): Isbjorn-1, which translates literally as 'Polar Bear-I.
- The Rohini rockets had till then flown only in the tropical hot and humid conditions in India.
- "The Svalbard archipelago, on the other hand, sits in the Arctic Ocean and temperatures were on the extremely low side,"
- ISRO had shipped the RH-300 Mk-II to Norway after qualifying it for arctic weather conditions
- The rocket, unfortunately, did not achieve the predicted height, rising only up to 71 km.
- The reason was a strange one. To keep the ambient temperature at 18 degrees Celsius, it was kept covered with a Veloster shroud.
- The idea was that it would pierce through the cover during launch.
- Instead, the rocket dragged it along,

and the increased drag resulted in a lower altitude

### **Velostat**

- Velostat, also known as Linqstat, is a packaging material made of polymeric foil (polyolefins) impregnated with carbon black to make it somewhat electrically conductive.
- It is used for the protection of items or devices that are susceptible to damage from electrostatic discharge.
- Electrostatic discharge (ESD) is a sudden and momentary flow of electric current between two electrically charged objects caused by contact, an electrical short, or dielectric breakdown.

### **Svalbard**

- Svalbard also known as Spitsbergen, or Spitzbergen, is a Norwegian archipelago in the Arctic Ocean. North of mainland Europe, it lies about midway between the northern coast of Norway and the North Pole.
- The islands of the group range from 74° to 81° north latitude, and from 10° to 35° east longitude.
- The largest island is Spitsbergen, followed in size by Nordaustlandet and Edgeøya. The largest settlement is Longyearbyen.

## THE HINDU

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### MSP

- the Centre announced the Minimum Support Price (MSP) for this year's summer (Kharif) season crops, hiking prices between 5-10% from last season,

#### How does the MSP work?

- The MSP, which is a part of the government's agricultural price policy, is the price at which the government offers to procure farmers' produce during the season.
- It works as a tool to stabilize production and to control consumer prices, yet farmers across the country have been facing problems with selling their produce at the MSP.
- Delays in establishing procurement centers, exploitation at the hands of commission agents, whom most of the time buy the produce from farmers below the MSP, and a lack of awareness about the MSP among a large section of farmers, are some of the challenges growers have been facing for years now.
- Against this background, farmers have been demanding a 'legal status' to the MSP
- Ineffective implementation of MSP and 'non-procurement' of all the crops at the MSP is also one of the main concerns of farmers.

- As per third advance estimates for 2022-23, total foodgrain production in the country is estimated at a record 330.5 million tonnes which is higher by 14.9 million tonnes compared to 2021-22.

- This is the highest increase in the last five years, according to government data.

- The delay in monsoon would impact cropping in non-irrigated regions of the country.

- "Around 51% area in the country is rain-fed, so if rains are delayed some impact is bound to be seen.

- But the country's foodgrains stocks are at a comfortable level, there's nothing to worry about as of now

## THE HINDU

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### Betelgeuse

- The bright red star Betelgeuse, called 'Thiruvathirai' or 'Ardra' in Indian astronomy, is easily spotted in the constellation Orion.

- By examining its pulsation the periodic contraction and expansion of the star researchers from Japan and Switzerland recently reported that the star is in its late carbon-burning stage.

- In massive stars like Betelgeuse, the carbon-burning stage lasts only up to a few hundred years, after which the star 'dies' and collapses into a

supernova within a few months.

- Most stars, including the Sun, fuse the simplest element in the universe, hydrogen, to produce helium and some energy as a byproduct.
- This energy's outward push balances gravity's inward pull, and keeps the star from collapsing.
- Massive stars like Betelgeuse run out of hydrogen fuel in only a few crore years, after which they switch to using helium to make carbon.
- The energy released in the fusion of helium is less than that of hydrogen, so the star burns more helium to stay stable and not collapse.
- The helium runs out in about ten lakh years.
- At this time, red giants like Betelgeuse burn carbon, then silicon, and briskly consume one by one the elements of the periodic table, until finally their core brims with iron whose fusion requires more energy than it releases and some cobalt and nickel
- Once the core is rich in iron, the temperature and pressure within the star drop.
- With nothing to stop it, gravity compresses the core and turns it into a neutron star or a black hole.
- Astronomers detect the expansion and contraction of a distant star by

dispersing its starlight into its various colors and examining the resulting spectrum.

- This pulsation also corresponds roughly to periodic variations in the observed brightness of the star.
- For Betelgeuse, astronomers have observed four approximate semi-regular pulsations with periods of 2,190, 417, 230, and 185 days

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## THE HINDU

### SIPRI

- China increased its nuclear arsenal to 410 warheads in January 2023 from 350 in January 2022, the Stockholm International Peace Research Institute (SIPRI)
- Depending on how it decides to structure its forces, China could potentially have at least as many intercontinental ballistic missiles (ICBMs) as either the U.S. or Russia by the turn of the decade, the Stockholm-based think tank said. "China has started a significant expansion of its nuclear arsenal.
- India and Pakistan also expanded their nuclear arsenal. Both countries introduced and continued to develop new types of nuclear delivery systems in 2022, the report noted.
- "While Pakistan remains the main focus of India's nuclear deterrent, India appears to be placing growing

emphasis on longer-range weapons, including those capable of reaching targets across China.”

- According to SIPRI estimates, India’s arsenal grew to 164 warheads in 2023 from 160 in 2022, and that of Pakistan from 165 to 170.
- Of the total global inventory of 12,512 warheads in January 2023, about 9,576 were in military stockpiles for potential use 86 more than in January 2022.
- Russia and the U.S. together possessed almost 90% of all nuclear weapons.
- The size of their respective nuclear arsenal (useable warheads) seemed to have remained relatively stable in 2022, although transparency regarding nuclear forces declined in both countries in the wake of the Ukraine war.

## THE HINDU

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### US IN UNESCO

- The UN cultural and scientific agency UNESCO announced on Monday that the U.S. plans to rejoin and pay more than \$600 million in back dues after a decade-long dispute sparked by the organization’s move to include Palestine as a member.
- U.S. officials say the decision to return was motivated by concern that China is filling the gap left by the

U.S. in UNESCO policymaking.

## THE HINDU

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### Homo naledi

- Of South Africa’s Rising Star cave system and discovered the first evidence of an extraordinary assemblage of hominin fossils.
- The remains of more than 15 individuals belonging to a previously unknown species of extinct human, dubbed Homo naledi, have been found in the cave.
- These short-statured, small-brained ancient cousins are thought to have lived in Southern Africa between 335,000 and 241,000 years ago.
- Rising Star Cave is an exceptional resource for exploring the origins of our species
- Three new studies made available today (as pre-prints awaiting peer review) claim to have found evidence Homo naledi intentionally buried their dead (a sophisticated practice we usually associate with Homo sapiens) and made rock art, which suggests advanced cognitive abilities.

## THE HINDU

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