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Launching Baby Squids and Tardigrades into Space

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Why in News

NASA will send **baby squids** and **tardigrades (also called water bears)** to the **International Space Station** for conducting various scientific studies.

Key Points

- **The Study:** These animals are part of **two separate scientific studies**.
 - **Behavior of Tardigrades (water bears) in a spaceflight environment.**
Tardigrades can adapt to extreme conditions on Earth, including high pressure, temperature and radiation.
 - **Impact of microgravity conditions** on the relationship between bobtail squids and beneficial microbes.
The squids are a part of the **UMAMI (Understanding of Microgravity on Animal-Microbe Interactions) study** which examines the effects of spaceflight on interactions between beneficial microbes and their animal hosts.

- **Importance of the Study:**
 - **Host-microbe Relationship:**
 - **On Earth**, it will help to find ways to **protect and even enhance the complex relationship between animals and beneficial microbes**, ensuring better human health and well being.
 - **In space**, the findings will help space agencies **develop better measures to protect astronauts from adverse host-microbe alterations** on long-duration missions.
 - **Longer Spaceflights:**
 - **The study on Tardigrades** will allow researchers to study their hardiness close up, and possibly identify the genes that allow them to become so resilient. This will help in safer and longer spaceflights.
 - **Similarly, a recent research in zebrafish** has demonstrated how **induced hibernation (torpor)** may protect humans from the elements of space, especially radiation, during space flight.

International Space Station

- ISS is a **habitable artificial satellite** - the single largest man-made structure in low earth orbit. Its first component was launched into orbit in 1998.
- It circles the Earth in roughly 92 minutes and completes 15.5 orbits per day.
- The ISS programme is a **joint project between five participating space agencies**: NASA (United States), Roscosmos (Russia), JAXA (Japan), ESA (Europe), and CSA (Canada) but its ownership and use has been established by intergovernmental treaties and agreements.
- It serves as a microgravity and space environment research laboratory in which crew members conduct experiments in biology, human biology, physics, astronomy, meteorology, and other fields.
- Continuous presence at ISS has resulted in the longest continuous human presence in low earth orbit.
- It is **expected to operate until 2030**.
- Recently, China **launched an unmanned module of its permanent space station** that it plans to complete by the end of 2022.
 - The module, named "**Tianhe**", or "**Harmony of the Heavens**", was launched on the **Long March 5B**, China's largest carrier rocket.
- India has also set its eye on **building its own space station in low earth orbit** to conduct microgravity experiments in space in 5 to 7 years.

Source: IE