

UPSC Daily Current Affairs | Prelim Bits 13-12-2024

Far Ultra Violet (FUV) Emissions from Novae

Astronomers from the Indian Institute of Astrophysics (IIA) have recently spotted Far Ultraviolet (FUV) emissions from novae for the first time in the neighbouring Andromeda galaxy.

- **Novae** - A **transient astronomical event** that causes the sudden appearance of a bright, apparently new star that slowly fades over weeks or months.
- All observed novae involve *white dwarfs in close binary systems*.
- It occurs in binary star systems where a white dwarf and a companion star (such as a Sun-like star or its evolved form) orbit closely.

A binary star is a system of two gravitationally bound stars that orbit a common centre of mass called a barycentre.

- **Novae Eruption** - The white dwarf's intense gravity pulls matter from the companion star, accumulating it on the white dwarf's surface.
- The piling up of matter creates the pressure and temperature increase, that triggering a fusion reaction that causes a **Bright Nova Eruption**.
- This accretion process is through the presence of a disc-like structure around the White Dwarf, known as the *Accretion Disk*.
- These disks are very hot and emit electromagnetic waves in the Ultra Violet (UV) and blue regions of the spectrum.
- **Far Ultraviolet (FUV) emission** - It is a radiation that refers to the wave band of ultraviolet radiation with *wavelengths ranging from around 200 to 280 Nano-meters*.
- AstroSat is the *first dedicated Indian astronomy mission*, aimed at studying celestial sources in X-ray, optical and UV spectral bands simultaneously.
- **Ultraviolet Imaging Telescope (UVIT)** - It is primarily an imaging instrument and a *part of AstroSat multi-wavelength space observatory*, operational since 2015.
- Its fine spatial resolution and unique capability to observe simultaneously in far UV and near UV.
- It led to the detection of accretion disks which is 2.5 million light years away.

References

1. [The Hindu| Far Ultra Violet \(FUV\) Emissions from Novae](#)
2. [PIB| Far Ultra Violet \(FUV\) Emissions from Novae](#)
3. [Tech Explorist| Far Ultra Violet \(FUV\) Emissions from Novae](#)

Darwin Wasp

Researchers from Ashoka Trust for Research in Ecology and the Environment (ATREE) have recently discovered 5 new species of the Darwin wasp from India and Thailand.

- Darwin Wasp is **an insect and a parasitic wasp** whose larvae consume their hosts within their body.
- **Taxonomy:**
 - **Scientific Name** - Ichneumonidae.
 - **Family** - Hymenoptera, comprising 42 subfamilies.
 - **Subfamily** - Microleptinae, being one of the smallest.
- It is the **first-ever species of these subfamily found in India.**
- Microleptinae contains a single genus, Microleptes with 14 previously known species worldwide.
- It is known as *Ichneumon*, *Ichneumonid*, *Ichneumonids*, or *Darwin wasps*.
- **Appearance** - Tiny winged, slender waist, a body formed of a head, thorax, abdomen, 6 legs and predominantly dark in colour.
- Their large pair of compound eyes on the side of the head and 3 ocelli (simple eyes) on the top of the head.



- **Uniqueness** - It have a longer antennae with more segments or sections.
- **Lifecycle** - Egg, Larvae, Pupa and Adult.
- **Habitat** - It is prefers frequent humid environments or to close forests.
- **Distribution** - Across the Asia, Europe, America and Africa.
- **Diet** - Feeding on the nectar and sap of flowers, shrubs and trees.

- **Breeding** - An adult female lay her eggs within a host through a process known as *Ovipositing*. Ovipositor is her stinger.
- **New species** - Of the 5 news species, *4 species was found in India* and 1 species in Thailand.

Scientific Name	Location	State
Microleptes chiani	Kalakad Mundanthurai Tiger Reserve	Tamil Nadu
Microleptes Gowrishankari	Biligiri Ranganathaswamy Temple Tiger Reserve	Karnataka
Microleptes Sandeshkaduri	Siang valley	Arunachal Pradesh
Microleptes Tehriensis	Tehri	Uttarakhand
Microleptes depressus	Thailand	-

References

1. [The Hindu| Darwin Wasp](#)
2. [Britannica| Darwin Wasp](#)

Pearlescent Blue Damsel fish

A group of scientists recently discovered a new damselfish species, the Pearlescent Blue Damselfish, on the Lhaviyani Atoll in the Maldives.

- Pearlescent Blue Damselfish is a ***small, pale, ghostly blue damselfish species*** in the tropical marine reef.
- **Scientific Name** - Chromis abadhah.
- Abadhah means 'perpetual' or 'perpetually' in Dhiveeli, the official language spoken in the Maldives.
- This name was chosen to recognize the *Rolex Perpetual Planet initiative*, which funded the Maldives expedition that led to this species' discovery.

Rolex Perpetual Planet initiative supports individuals and organizations using science to understand the world's environmental challenges and devise solutions that will restore balance to our ecosystems.

- **Appearance** - Small-sized, pearly white with pale blue scales lighter below its eyes is a very reflective, silvery-blue circle surrounding the darker central portion of the iris.
- The ridge between its *eyes is greenish-silver* and its *lips are pale blue*.



- **Habitat** - Found in areas with *tiny crevices and caves* close to large numbers of sponge species, which are marine invertebrates.
- **Distribution** - It is widely distributed ***throughout the Maldives*** between Lhaviyani and Dhaalu atolls.
- It lives in *nooks and crannies in the deep sea coral reefs* of the Maldives, a region known as the *Mesophotic Zone*.

Mesophotic Zone is brightly lit shallow waters and the ocean's darkest depths, like a "middle light" zone. Here, 30-150 meters beneath the surface, is the furthest that sunlight can penetrate the ocean.

- **Diet** - It is an *omnivorous* and feeds on Zooplankton, benthic algae, worms, copepods, brine shrimp and mysis shrimp, frozen fish, flake and pellet foods.
- **Other similar species:**
 - Blue Damsel fish.
 - Orangetail Damsel fish.

Reference

1. [Forbes| Pearlescent Blue Damsel fish](#)