

## Saraswati - A Supercluster Galaxy

### Why in news?

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Indian astronomers discovered Supermega River of galaxies.

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### What is it?

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- A team of Indian astronomers has identified a cosmic behemoth - a supercluster of galaxies - about 4 billion light- years away from us

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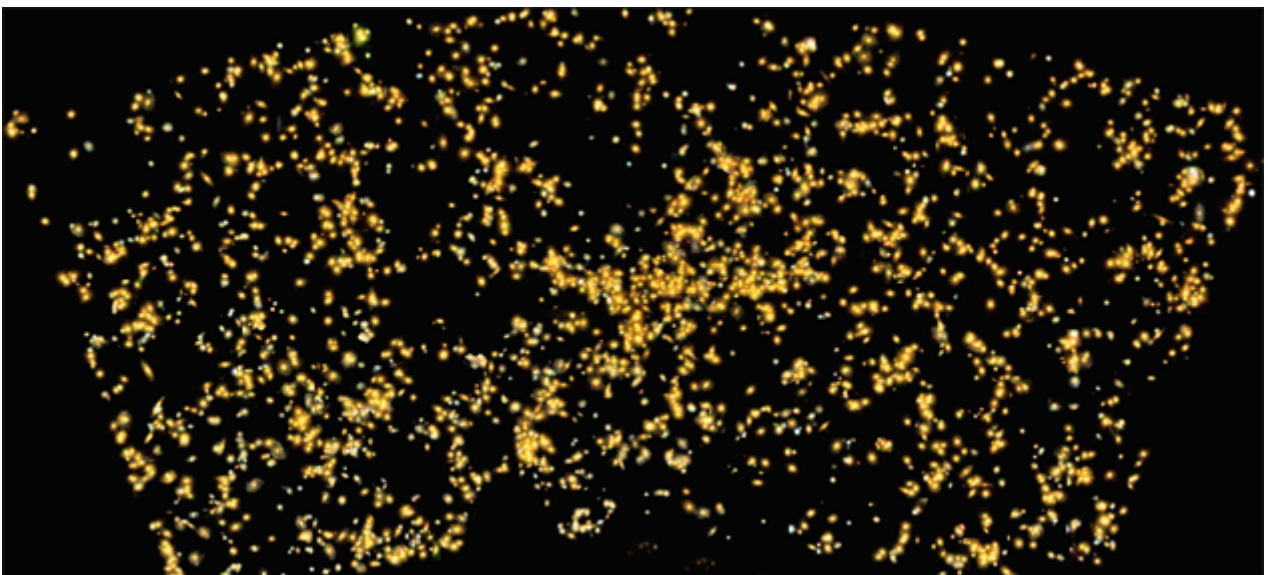
- The new discovery has been named saraswati.

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- The supercluster spans over 650 million light years in its expanse, containing over 10,000 galaxies in 42 clusters.

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### Why is it important?

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- The discovery is forcing astronomers to rethink about early stages of the evolution of the universe.

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- It also provides vital clues about the mysterious dark matter and dark energy.

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- The saraswati supercluster clearly stands out in the sky as an especially rare, and possibly among the mega superclusters exceeding 500 million light years in size.

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- A large scale structure this massive evolves very slowly.

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- Therefore it may reflect the whole history of galaxy formation and the primordial initial conditions that have seeded it.

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### **How it challenges current model?**

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- The long-popular “cold dark matter” model of evolution of universe predicts that small structures like galaxies form first, which congregate into larger structures.

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- The existence of large structures such as the “Saraswati Supercluster” that evolved as early as 10 billion years since the big bang is a challenge to this model.

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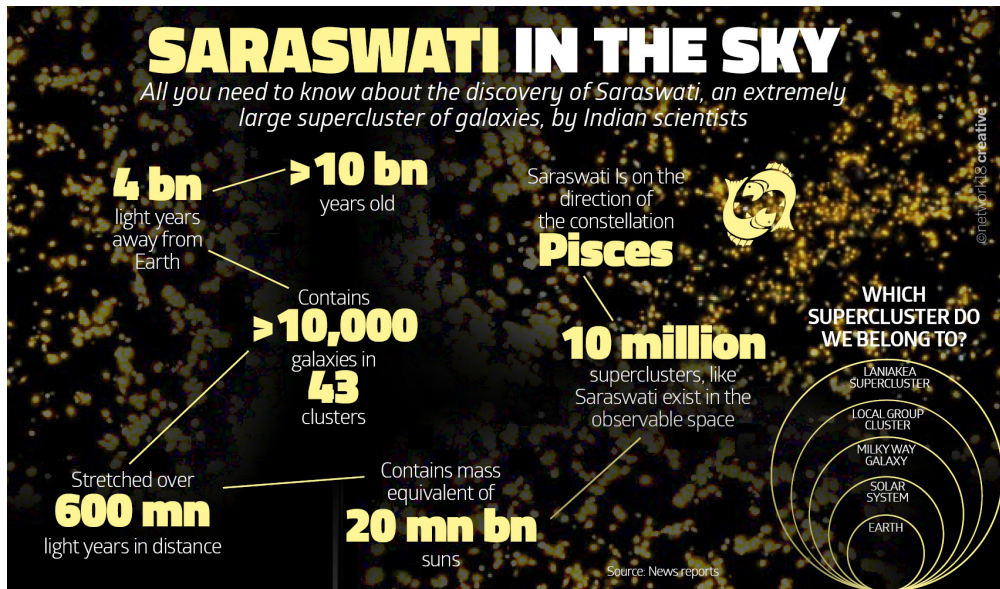
- Thus forces astronomers into re-thinking popular theories of how the universe got its current form.

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- Our work will help to shed light on the perplexing question how such extreme large scale, prominent matter-density enhancements had formed billions of years in the past when the mysterious Dark Energy had just started to dominated structure formation.

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## What are super clusters?

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- It is a large group of smaller galaxy clusters or galaxy groups
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- It is among the largest-known structures of the cosmos.
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- The Milky Way is part of the Local Group galaxy cluster (that contains more than 54 galaxies), which in turn is part of the Laniakea Supercluster.
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- This supercluster spans over 500 million light-years, while the Local Group spans over 10 million light-years.
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- The number of superclusters in the observable universe is estimated to be 10 million.
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## What is Sloan Digital Sky Survey?

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- The **Sloan Digital Sky Survey** or **SDSS** is a major multi-spectral imaging and spectroscopic redshift survey by USA
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A **redshift survey** is a survey of a section of the sky to measure the redshift of astronomical objects: usually galaxies, but sometimes other objects such as galaxy clusters or quasars.

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- It is an ambitious plan to make a digital 3D map of the universe.

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- It started in the year 2000, and over eight years it mapped more than a quarter of the sky.

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- It has mapped nearly 930,000 galaxies. The SDSS has found nearly 50 million galaxies so far.

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- In its third phase, SDSS-III, which started in 2008 and ended in 2014, gave out sets of data that were released in 2011, 2012 and 2013.

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- It produced a map of the North galactic cap and of three stripes in the South Galactic Cap and the central stripe is known as **Stripe 82**.

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