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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