# Professor proposes new theory challenging Big Bang with bursts of cosmic expansion



A new theory proposed by Professor Richard Lieu of The University of Alabama in Huntsville presents a significant challenge to the widely accepted Big Bang model of the universe's origin. Rather than the universe starting with a single colossal explosion, Lieu suggests in a paper published in the journal Classical and Quantum Gravity that the cosmos has expanded through numerous rapid bursts, referred to as 'temporal singularities,' throughout its history.

According to this alternative explanation, these temporal singularities intermittently released new matter and energy into space, contributing to the formation of planets, stars, galaxies, and all other cosmic structures observed today. This contrasts with the traditional Big Bang theory, which posits that the universe began approximately 13.8 billion years ago from an infinitely dense, hot point that suddenly expanded in a massive explosion.

The standard Big Bang model has remained the dominant cosmological theory since the 1960s, supported by a wealth of observational data. However, it relies heavily on the existence of dark matter and dark energy—hypothetical forms of matter and energy believed to fill the universe but have yet to be directly detected. Dark matter is thought to provide the gravitational "scaffolding" necessary for the formation of galaxies and galaxy clusters shortly after the Big Bang, while dark energy is theorised to be driving the accelerated expansion of the universe.

Lieu's theory addresses what he sees as a major limitation in the Big Bang model by not requiring these elusive substances. Instead, the temporal singularities continuously emit bursts of energy and matter that collectively drive cosmic expansion. He explains that these bursts are rare and brief, dissipating too quickly to be detected by existing observational technologies such as telescopes.

The temporal singularities concept attempts to account for the observed expansion of the universe and its structure without invoking dark matter or dark energy. Lieu is now planning to test his theory by searching for 'jumps' in redshift—a phenomenon where light from distant objects shifts towards the red end of the spectrum as they move away. Such discontinuities in redshift measurements could indicate episodic bursts influencing cosmic expansion.

Despite its innovative approach, the theory has notable challenges. The transient nature of temporal singularities makes them inherently unobservable with current equipment, similar to the difficulties faced in detecting dark matter and dark energy. Moreover, the model does not yet explain what generates these bursts, and it lacks direct experimental verification. The prevailing Big Bang theory remains supported by substantial indirect evidence for dark matter and dark energy, which the new model must address to gain broader acceptance.

The Daily Mail is reporting that while Professor Lieu's temporal singularities theory offers an intriguing alternative framework for the universe's origin and expansion, it remains speculative pending further observational support and experimental validation.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://phys.org/news/2025-04-dark-energy-nature-universe.html> - Details Lieu's proposal of transient temporal singularities replacing dark matter/energy and explains the expansion via step-like bursts.
* <https://www.popularmechanics.com/space/deep-space/a64436485/multiple-singularities-dark-energy/> - Supports Lieu's assertion that singularities, not dark energy, drive cosmic expansion acceleration.
* <https://modernsciences.org/transient-singularities-dark-matter-dark-energy-theory-april-2025/> - Describes transient singularities as brief energy bursts enabling cosmic expansion without dark matter/energy.
* <https://www.space.com/the-universe/matter-spewing-singularities-could-eliminate-the-need-for-dark-energy-and-dark-matter> - Explains how transient singularities generate negative pressure mimicking dark energy's effects on expansion.
* <https://www.thebrighterside.news/post/new-theory-challenges-big-bang-dark-matter-and-dark-energy-in-the-birth-of-the-universe/> - Corroborates the challenge to the Big Bang model via temporal singularities for structure formation and expansion.
* <https://phys.org/news/2025-04-dark-energy-nature-universe.html> - Reiterates the model's avoidance of exotic concepts like negative mass and its focus on observable structure formation.
* <https://www.dailymail.co.uk/sciencetech/article-14648333/scientist-big-bang-theory-wrong-universe-beginning.html?ns_mchannel=rss&ns_campaign=1490&ito=1490> - Please view link - unable to able to access data