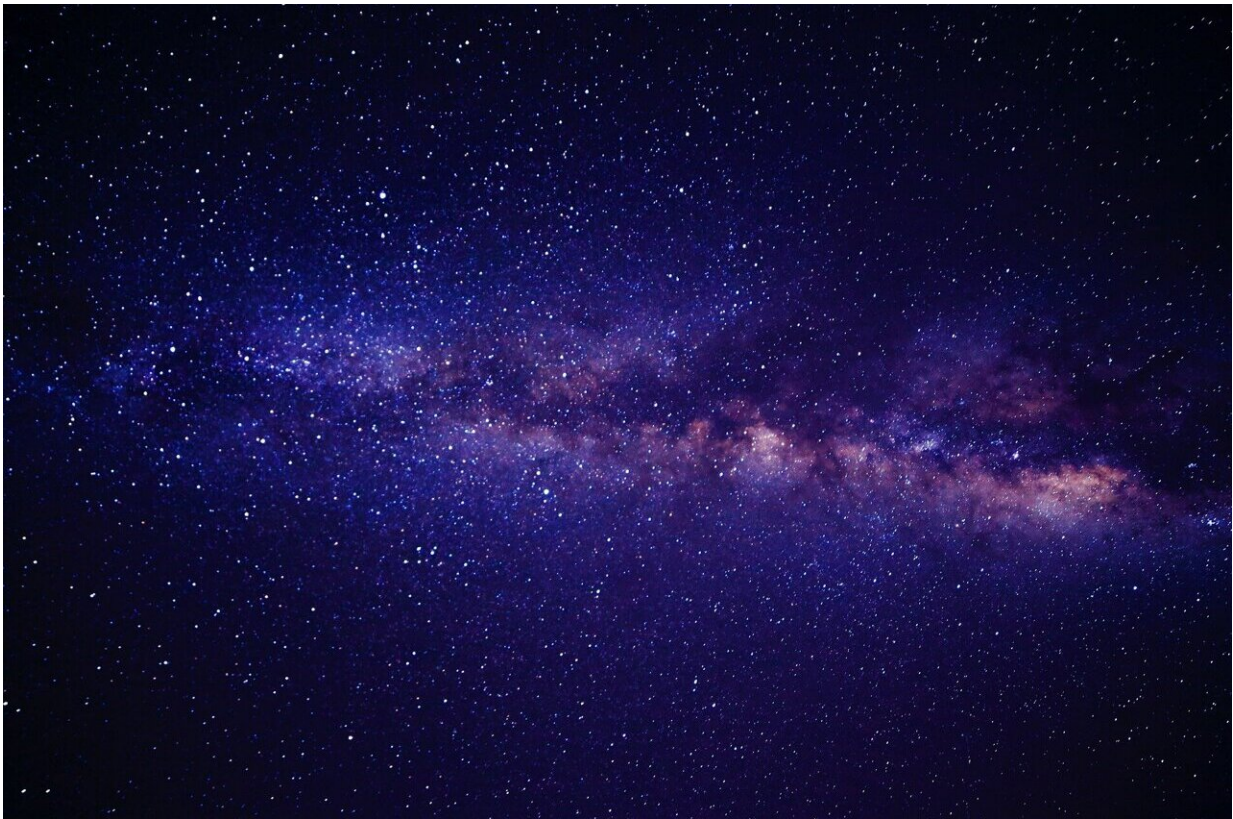


# Observational study supports century-old theory that challenges the Big Bang

September 11 2024, by Grant Guggisberg

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Northeastern University researchers have shown that our visible universe and invisible dark matter likely co-evolved from the time of the Big Bang. Credit: Pixabay/CC0 Public Domain

A Kansas State University engineer recently published results from an observational study in support of a century-old theory that directly

challenges the validity of the Big Bang theory.

Lior Shamir, associate professor of computer science, used imaging from a trio of telescopes and more than 30,000 galaxies to measure the redshift of galaxies based on their distance from Earth. Redshift is the change in the frequency of [light](#) waves that a galaxy emits, which [astronomers](#) use to gauge a galaxy's speed.

Shamir's findings lend support to the century-old "tired light" theory instead of the Big Bang. The findings are [published](#) in the journal *Particles*.

"In the 1920s, Edwin Hubble and George Lemaitre discovered that the more distant the galaxy is, the faster it moves away from Earth," Shamir said. "That discovery led to the Big Bang theory, suggesting that the universe started to expand around 13.8 billion years ago. At around the same time, preeminent astronomer Fritz Zwicky proposed that galaxies that were more distant from Earth did not really move faster."

Zwicky's contention was that the redshift observed from Earth is not because the galaxies move but because the light photons lose their energy as they travel through space. The longer the light travels, the more energy it loses, leading to the illusion that galaxies that are more distant from Earth also move faster.

"The tired light theory was largely neglected, as astronomers adopted the Big Bang theory as the consensus model of the universe," Shamir said. "But the confidence of some astronomers in the Big Bang theory started to weaken when the powerful James Webb Space Telescope saw first light.

"The JWST provided deep images of the very early universe, but instead of showing an infant early universe as astronomers expected, it showed

large and mature galaxies. If the Big Bang happened as scientists initially believed, these galaxies are older than the universe itself."

While new imaging casts doubt on the Big Bang, Shamir's study used the constant rotational velocity of the Earth around the center of the Milky Way to examine the redshift of galaxies that move in different velocities relative to Earth and to test how the change in the redshift responds to the change in velocity.

"The results showed that galaxies that rotate in the opposite direction relative to the Milky Way have lower redshift compared to galaxies that rotate in the same direction relative to the Milky Way," Shamir said. "That difference reflects the motion of the Earth as it rotates with the Milky Way. But the results also showed that the difference in the redshift increased when the galaxies were more distant from Earth.

"Because the rotational velocity of the Earth relative to the galaxies is constant, the reason for the difference can be the distance of the galaxies from Earth. That shows that the [redshift](#) of galaxies changes with the distance, which is what Zwicky predicted in his Tired Light [theory](#)."

**More information:** Lior Shamir, An Empirical Consistent Redshift Bias: A Possible Direct Observation of Zwicky's TL Theory, *Particles* (2024). [DOI: 10.3390/particles7030041](https://doi.org/10.3390/particles7030041)

Provided by Kansas State University

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