JWST Observations and Their Interpretation in the Pivot Universe

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Abstract

Recent observations from the James Webb Space Telescope (JWST) reveal massive, chemically evolved galaxies and compact massive objects at extreme redshifts. When redshift is interpreted as cosmic age, as in the standard ΛCDM model, these findings generate tensions with hierarchical structure-formation timescales. In the Pivot Universe (PU) framework, redshift is a spatial coordinate determined by gravitational and kinematic effects in a stationary Kerr-like geometry rather than a measure of cosmic time. The visible universe is a thin shell outside the Pivot event horizon, created quasi-simultaneously during a single global event. Consequently, all galaxies share approximately the same absolute evolutionary time. JWST observations therefore arise naturally from the PU geometry rather than representing anomalies.

1. JWST Observational Tensions with ΛCDM

JWST observations indicate (i) massive galaxies at redshifts $z \gtrsim 10–14$, (ii) a high number density of luminous early galaxies, (iii) evidence for early chemical enrichment, and (iv) massive compact objects consistent with black holes in primitive systems. In ΛCDM, redshift is directly related to cosmic time:

$$t = t(z).$$

Hence large z implies youth and limited evolutionary time, producing the “early massive galaxy” problem.

2. Structure of the Pivot Universe

The structure of the Pivot Universe is described in detail in: https://ai.vixra.org/abs/2601.0075. The PU is a stationary Kerr-like gravitational system organized around a massive rotating central object (the Pivot). The visible universe forms a thin spherical shell outside the event horizon:

$$R^+ < r < R_{CMB}.$$

All matter in this shell is created quasi-simultaneously during the Pivot explosion. Redshift is a positional quantity determined by gravitational and kinematic effects:

$$1 + z(r) = (1 + z_{gk})(1 + z_D).$$

Therefore, redshift is not an indicator of age:

$$t_{formation} \neq t(z).$$

3. Common Creation Time of All Galaxies

Because the entire visible shell is created in a single event:

$$t_{MW} \simeq t_{JADES} \simeq t_{CEERS} \simeq t_{Lynx} \simeq t_{creation}.$$

High-redshift galaxies are not younger than low-redshift galaxies; they are located deeper in the gravitational redshift field.

4. Primordial Black Holes and Galaxy Formation

In PU, black holes are primordial products of the Pivot explosion. A black hole of mass M_{BH} gravitationally captures stars whose trajectories pass within its Hill radius:

$$R_H \simeq r \cdot \left(M_{BH} / (3 M_{Pivot}) \right)^{(1/3)}.$$

Captured stars form a rotating disk. Differential rotation,

$$\Omega(r) \neq \text{const},$$

naturally generates spiral density structures. If few stellar trajectories intersect the capture region, no luminous galaxy forms.

5. Interpretation of JWST Observations in PU

In PU, JWST observations follow directly: (1) massive high-redshift galaxies are expected since all systems share the same absolute evolutionary time; (2) high galaxy number densities require no extreme star-formation efficiency; (3) early metal enrichment reflects normal stellar evolution; (4) early massive black holes are primordial and can serve as galactic nuclei; (5) spiral galaxy morphology arises from gravitational capture and differential rotation. Thus, JWST observations are a direct consequence of the PU geometry.