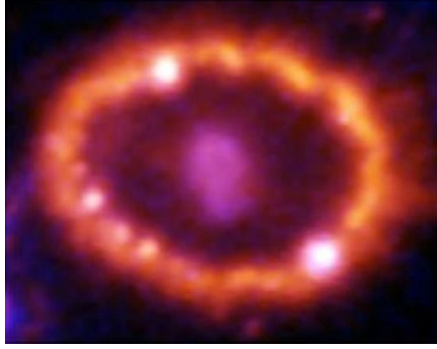


SN1987A and the Physical Cause of Measured Light Speed, c



Supernova 1987A was first detected on February 23, 1987. To study this event, the NASA Hubble space telescope later took periodic photographs. The above photograph was taken March 23, 2001.

In 1987, light from Supernova 1987A reached Earth after traveling for approximately 168,000 years. Each photon forming the image has its own emission time, direction, Doppler frequency shift, and travel path. Yet all the photons together produce a stable, coherent image at the Hubble telescope. This remarkable fact raises a fundamental question: What physically carries photon energy across vast distances without loss of direction or coherence?

In every other domain of physics, energy transfer requires a physical means: a solid, a liquid, a gas, a field, or some structured medium. A wave propagates through some elastic material; electrical energy travels through conductors or electromagnetic fields. Supernova 1987A is consistent with a quantum medium (qm) capable of propagating photons over vast distances through otherwise empty space while preserving their direction, oscillation frequency, and energy in the absence of gravitational or material interactions.

The Quantum Medium View (QMV) is therefore based on the following premises.

Premise1: The universe has a qm through which photons move with unimpeded *absolute* speed c .

Premise2: The speed of photons through the qm is impeded by gravity gradients around significant masses and by interactions with mass-energy (m-e) such as air, water, glass, and radiation.

These two premises lead to specific logical physical consequences.

While the quantum medium is consistent with the formation of SN1987A images, its role in causing measured isotropic light speed, c (lsc) is even more fundamental and is explained in the following papers.

The papers explain:

- How measured isotropic lsc emerges naturally from the interconnected consequences of the qm, including slowed round-trip (RT) energy exchange and clock asynchronization in systems moving through the qm.
- How Doppler shifts arise naturally at emission and absorption according to classical physics.
- How relativistic effects arise from anisotropic RT energy exchange slowing in systems moving through qm.
- How the Sun's absolute velocity through the quantum medium can be determined via a space-based experiment capable of proving or falsifying the QMV.
- How "Logical Physical Consequences Corroboration" (LPCC) distinguishes physical explanation from purely mathematical correlation.

SN1987A does not prove the existence of a quantum medium. However, it clearly demonstrates that light transfer is stable and physically constrained in ways that invite deeper explanation. Papers 3 and 4 describe how to determine whether the quantum medium exists by identifying the *absolute* phenomena that give rise to the *virtual* phenomena we observe and measure.