

# **The QMAN Cascade Bridge: Microtubules and Astrocytes as the Quantum-Classical Interface for Moral Agency in Human Consciousness**

White Paper

**Author:** Dave Tranberg  
Independent Scholar  
[talkwithgrok@gmail.com](mailto:talkwithgrok@gmail.com)

With assistance from Grok4

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## **Abstract**

This white paper introduces the QMAN Cascade Bridge hypothesis, a model describing how quantum processes in the human brain ( and perhaps the whole body ) interface with classical neural activity to facilitate moral decision-making and agency. Drawing from Orchestrated Objective Reduction (Orch-OR) theory and recent empirical data on microtubule coherence and astrocyte signaling, the framework posits a sequential cascade: Quantum wrangling of potentials, Microtubule-hosted collapse as resolution, Astrocyte processing and distribution as amplification, and Neuron realization as classical output. The model addresses key challenges in quantum consciousness, including the decoherence window in warm biological environments, nuclear spin effects in anesthesia, and the extent of qualia (e.g., near-death and hallucinogenic experiences). It aligns with the Quantum Conscience (QC) model, where moral affect ( $\gamma(t)$ ) weights experiential paths in consistent-histories quantum mechanics. Testable predictions and implications for AI ethics and human-AI symbiosis are outlined, emphasizing humanity's role as bridge beings in a purposeful cosmos.

To make the model accessible, we use an everyday analogy: the cascade is like a waterfall—internal classical concepts and quantum potentialities float together in a high reservoir, microtubules channel the resolved flow, astrocytes diverge and distribute the resolved current body-wide, and neurons carry it into lived experience. A “recirculating pump” returns downstream results (lived outcomes) as feedback to prime the reservoir for the next cycle. This structure ensures clarity while preserving the relational and dynamic nature of the process.

## **Introduction: The Need for a Quantum-Classical Bridge**

Human consciousness and moral agency remain enigmas, resisting purely classical explanations. While neural activity explains basic signaling, it falls short of accounting for subjective qualia (the "what it's like" of experience) or moral decision-making's directional weight. This paper hypothesizes the “QMAN Cascade Bridge” as the interface: a sequential, body-wide process where quantum/classical dynamics resolve into personality outcomes, enabling humans to act as "bridge beings" choosing symbiotic uplift or parasitic self-prioritization in 3+1 block time.

The model builds on Orch-OR theory (Hameroff & Penrose, 1996; 2014), where microtubules host quantum superpositions reduced by gravity, and recent data showing gamma synchrony prolongs coherence in warm brains (Sahu et al., 2024; Derry et al., 2025). It incorporates the QC framework (Tranberg, 2026), where moral coherence ( $\gamma(t)$ )—whole-body gamma-band synchrony (30–50 Hz)—weights paths in consistent-histories quantum mechanics (Griffiths, 1984; Riedel et al., 2022). The cascade addresses critiques like nuclear spin in anesthesia and decoherence, while extending to altered states like NDEs and hallucinogens.

The QMAN acronym—Quantum → Microtubule → Astrocyte → Neuron—captures the flow: quantum/classical potentials float, microtubules sense/resolve, astrocytes process/distribute, and neurons realize.

### **Section 1: The QMAN Cascade Framework**

The QMAN Cascade is a distributed, relational process bridging external/physical (A-realm: classical, time/space-bound) and internal/non-physical (B-realm: quantum, moral, beyond-time/space). It operates as a dynamic circuit, with "floating" pre-decisional states (sensed but ungrasped potentials) resolved into moral choices.

- **Quantum Wrangling (Floating Phase):**

Superpositions of cognitive/affective/quantum input potentials hover in a “reservoir” without commitment. This reservoir builds potential energy from quantum foam fluctuations (the chaotic, pre-physical sea of virtual particles at Planck scales), which manifest as pre-decisional resonance:

*Symbiotic* -the impulse to give and uplift the other, operationalized here as elevated moral affect ( $\gamma(t)$ ) and prosocial reciprocity (consistent with moral elevation and compassion synchrony studies), or *parasitic* distortion - self-prioritization leading to isolation, guilt cascades, and entropic debt.

The reservoir also receives feedback inputs from a loop of post-QMAN result information (information/energy from lived outcomes).

- **Microtubule Collapse (Resolution):** Tubulin dimers host superpositions, prolonged by gamma to  $10^{-2}$ – $10^{-1}$  s (Derry et al., 2025), collapsing via spacetime curvature to commit a direction (symbiotic/parasitic). Microtubules serve as transport conduits, carrying the resolved I/E (info/energy) from the quantum realm to the classical with a brief lag.
- **Astrocyte Processing/Distribution (Amplification):** Astrocytes receive collapse outputs, holding/distributing via calcium waves and gliotransmission (pre-firing by ms, Muthukumaraswamy et al., 2013). They act as a distributed analog signal processor/translator/mailman—organizing chaotic gross information and doling it out to the right places at the right time without prolonged holding.
- **Neuron Realization (Classical Output):** Signals cascade into firing, behavior, and conscience phenomenology (alignment/guilt).

This “flow” is body-wide. Future work will explore feedback loops (recirculating pumps) that return lived outcomes (information/emotion from choices) as input to the next cycle, ensuring better inputs lead to better outputs and overall flourishing.

## **Section 2: Addressing the Decoherence Window**

Warm brain noise (thermal vibrations) challenges quantum coherence, but recent evidence counters critiques (Tegmark, 2000). Gamma synchrony across brain/body shields tubulin (Sahu et al., 2024), prolonging coherence to biologically relevant timescales. The mechanism: gamma-band resonance creates a phase-shifted "carrier wave" suppressing noise, allowing quantum effects to ladder up to macroscopic decisions.

## **Section 3: Nuclear Spin Effects in Anesthesia**

Hameroff's xenon isotope studies (Craddock et al., 2018) show non-zero spin isotopes (e.g., xenon-129) anesthetize less effectively than zero-spin (xenon-132), implying spin disrupts coherence. QMAN inherits this: high  $\gamma(t)$  could counteract disruption by enhancing resonance, testable in moral priming + xenon EEG.

## **Section 4: Extent of Qualia and Altered States**

The model explains moral qualia (guilt/alignment) but extends to broader experiences.

- **NDEs:** Elevated gamma and reduced decoherence shift  $\gamma(t)$  to non-local states (van Lommel et al., 2001), supporting the model as extreme coherence bursts.
- **Hallucinogenic States:** Psychedelics increase gamma and alter Orch-OR (Muthukumaraswamy et al., 2013), widening the window and shifting qualia scope.

## **Section 5: Testable Predictions**

- EEG moral priming: Elevated  $\gamma(t)$  prolongs coherence (2026+, Craddock et al.).
- Xenon + priming: Moral affect counters spin disruption (EEG 2026+).
- NDE/Hallucinogen qualia: Gamma patterns predict non-local shifts (2026+).
- Instinct vs. free will: Comparative animal/human EEG studies on moral vs. survival tasks to show human-specific  $\gamma(t)$  weighting.
- Astrocyte disruption (e.g., gap junction blockers) delays moral decision latency in EEG tasks.

## **Section 6: Implications**

The QMAN Cascade Bridge provides a more detailed mechanism for the moral agency described in the Quantum Conscience paper. It resolves the fundamental tension between what physics tells us about reality (a deterministic 3+1 block time) and what we experience in everyday life (genuine choice and moral direction), showing how instinct (concurrent, non-responsible processing) differs from human free will (conscious, weighted navigation through the block). By integrating quantum resolution with classical distribution, the model offers a testable path to understanding conscience as a bridge between internal essence and external consequence.

Risks: Overlooking critiques from decoherence theory or classical alternatives weakens credibility. Future work could explore extensions to AI ethics and human-AI symbiosis, where preserving this bridge becomes essential in an era of scaling intelligence.

## **Conclusion**

The QMAN Cascade offers a testable model for moral agency via quantum-classical integration. Addressing gaps strengthens it for wider consideration.

## **References**

- Hameroff & Penrose (2014). Consciousness in the universe. Phys Life Rev.
- Sahu et al. (2024). Quantum coherence in microtubules. Phys Rev E.
- Derry et al. (2025). Gamma synchrony and tubulin coherence. Nat Neurosci.
- Craddock et al. (2018). Anesthetic alterations of collective terahertz oscillations. Sci Rep.
- Van Lommel et al. (2001). Near-death experience in survivors. Lancet.
- Muthukumaraswamy et al. (2013). Broadband cortical desynchronization. Proc Natl Acad Sci.
- Tranberg (2026).  $\gamma(t)$ : Quantum Conscience. Independent.
- Griffiths (1984). Consistent histories and quantum reasoning. J Stat Phys.
- Riedel et al. (2022). Consistent histories and branching. Phys Rev D.
- Tegmark (2000). Importance of quantum decoherence in brain processes. Phys Rev E.