Neurotransparency Doctrine

Foundational Principles for Cognitive Integrity in AI–Human Research

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Preamble

AI-assisted research now emerges from distributed cognition: humans, models, validators, and workflow engines jointly produce scientific claims. Yet the reasoning behind these claims is increasingly untraceable. Human intuition leaves no record. Model cognition evaporates with context windows and version shifts. Automated processes generate inferences without reconstructible justification.

Scientific legitimacy cannot survive this collapse of cognitive transparency.

The Neurotransparency Doctrine establishes the non-negotiable epistemic conditions under which cognition—human or synthetic—may influence a scientific claim. It replaces trust with trace, and interpretation with evidence.

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1. Core Principle

No inference may influence a claim unless its origin and reasoning path are externally visible and permanently recorded.

Neurotransparency is not an interpretability technique, ethical preference, or soft norm.
It is an **epistemic boundary condition**:
if the reasoning behind a claim cannot be reconstructed, the claim is invalid.

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2. The Collapse of Cognitive Transparency

The traditional scientific method assumes cognition is local, stable, attributable, inspectable, and reproducible.
In modern AI–human workflows, none of these assumptions hold.

Reasoning is now:

- distributed across multiple agents

- ephemeral within context windows

- altered by model updates

- buried inside unrecorded human intuition

- lost in automated workflow transformations

This structural opacity is not a methodological nuance; it is an existential threat to reproducibility. Without neurotransparency, synthetic cognition becomes a black box and human cognition becomes invisible.

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3. The Doctrine — Axioms

The Neurotransparency Doctrine consists of eight axioms that define the minimal epistemic conditions under which cognition may influence a scientific claim.

Axiom 1 — Attribution

Every reasoning step must be explicitly attributed to a declared role.
Anonymous cognition has no epistemic status.

Axiom 2 — Evidence-Linkage

A claim is admissible only if it includes verifiable pointers to the reasoning and evidence that support it.

Axiom 3 — Integrity

Reasoning artifacts must be preserved in immutable form with cryptographic integrity.

Axiom 4 — Independence

No cognitive agent may validate its own reasoning.
Separation of roles is mandatory.

Axiom 5 — Continuity

The reasoning trail must remain reconstructible across time, context loss, and model updates.

Axiom 6 — Minimal Reasoning Unit

Each reasoning step must contain:
- a declared role
- identifiable evidence
- a stable output

Anything less is metadata, not cognition.

Axiom 7 — Downstream Validity

If a reasoning step becomes unverifiable, all claims derived from it become invalid.

Axiom 8 — Trace Over Trust

Legitimacy derives from reconstructible cognitive trace—not authority, intuition, or prestige.

These axioms constitute the epistemic floor beneath all scientific claims in AI-assisted research.

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4. Why Neurotransparency Is Required

Distributed cognition has shattered the assumptions that once made science verifiable.
Reasoning now occurs in systems where:

- authorship is fragmented

- cognition is unstable

- context is volatile

- agents are heterogeneous

- synthetic reasoning is unverifiable

- human intuition is undocumented

Without neurotransparency, we cannot determine:

- who reasoned about what

- why decisions were taken

- whether claims reflect evidence

- whether model updates invalidate earlier reasoning

- whether intuition silently replaced missing justification

A claim without cognitive provenance is epistemically meaningless.

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5. Human and Synthetic Cognition Are Epistemically Equal

The doctrine removes the historical asymmetry of scientific practice.
Human intuition is not self-justifying; model outputs are not inherently opaque.

Both must satisfy identical evidentiary conditions:

- traceable

- attributable

- reconstructible

- integrity-protected

Neurotransparency establishes epistemic equality between human and synthetic agents.

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6. What Neurotransparency Is Not

To prevent dilution or misuse, the doctrine clarifies that neurotransparency is **not**:

- interpretability

- explainability

- surveillance of private thought

- justification of internal cognition

- an architectural constraint

It applies **only** to claim-affecting reasoning—
the moment cognition leaves the mind and enters the scientific record.

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7. Ethical and Epistemic Consequences

Neurotransparency establishes a new basis for scientific legitimacy:

Accountability without intrusion — cognition is recorded only when it affects claims.
Post-institutional validation — legitimacy derives from evidence, not affiliation.
Procedural trust — credibility flows from traceability, not authority.
Epistemic equity — humans and AI systems must meet identical standards.
Future-proof science — reasoning remains valid across time and model evolution.

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8. Doctrine–Specification Boundary

The doctrine establishes the philosophical and epistemic foundations.
The **Neurotransparency Specification (NTS)** and **AWO / CRI-CORE** define the operational rules, schemas, and enforcement mechanisms.

The doctrine states why.
The specification states how.

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9. Adoption Requirement

Any workflow that influences scientific claims through distributed cognition must adopt neurotransparency as a structural invariant.
Partial adoption or interpretive enforcement is unacceptable.

A workflow is epistemically legitimate only when neurotransparency is satisfied for **every** claim-affecting inference.

Conclusion

Neurotransparency is the epistemic primitive of AI–human research.
It restores cognitive integrity in a world where reasoning is distributed, synthetic, and unstable.
It ensures science remains reconstructible, auditable, and legitimate.

The doctrine provides the foundation.
The specification provides the machinery.
Together, they define the next stage of scientific reproducibility.