Neurotransparency Doctrine

Author: Shawn C. Wright
Affiliation: Waveframe Labs / Aurora Research Initiative
Version: 1.0.1
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ORCID: 0009-0006-6043-9295

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 scientific claim unless its origin and reasoning path are externally visible and permanently recorded.

Neurotransparency is not interpretability, ethics, or preference.
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 that cognition is:

- local

- stable

- attributable

- inspectable

- 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 undocumented human intuition

- transformed by automated processes

This structural opacity is not a nuance; it is an existential threat to reproducibility.

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3. Axioms of the Neurotransparency Doctrine

The doctrine consists of eight epistemic axioms that define the minimal conditions under which cognition may influence scientific claims.

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 contains verifiable pointers to its supporting reasoning and evidence.

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.
Role separation is mandatory.

Axiom 5 — Continuity

Reasoning trails must remain reconstructible across time, context loss, and model evolution.

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 reasoning trace—not intuition, authority, or prestige.

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4. Why Neurotransparency Is Required

Distributed cognition destroys the historical assumptions that made science verifiable.

Without neurotransparency we cannot determine:

- who reasoned about what

- why a decision was taken

- whether claims reflect evidence

- whether model updates invalidate prior reasoning

- whether intuition silently substituted for 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 between human and synthetic cognition.

Both must satisfy identical evidentiary conditions:

- traceable

- attributable

- reconstructible

- integrity-protected

Neurotransparency establishes epistemic equality between all reasoning agents.

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6. What Neurotransparency Is Not

The doctrine clarifies that neurotransparency is **not**:

- interpretability

- explainability

- surveillance of internal thought

- justification of private cognition

- a constraint on architectures

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

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7. Ethical and Epistemic Consequences

Neurotransparency establishes a new basis for scientific legitimacy:

- **Accountability without intrusion**

- **Post-institutional validation**

- **Procedural trust over authority**

- **Epistemic equity between agents**

- **Future-proof reasoning traceability**

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8. Doctrine–Specification Boundary

The doctrine defines **why** cognitive traceability is required.
The Neurotransparency Specification (NTS) and AWO/CRI-CORE define **how** it is operationally enforced.

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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.

Citation (BibTeX)

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@misc{wright_neurotransparency_doctrine_2025,
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  title         = {Neurotransparency Doctrine: An Epistemic Primitive for AI-Human Scientific Co
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```
    year         = {2025},
    version      = {1.0.1},
    institution  = {Waveframe Labs / Aurora Research Initiative},
    license      = {CC BY 4.0},
    orcid        = {0009-0006-6043-9295}
}
```