# Logic Evaluation Engine (LEE)

**Executive Summary**
The Logic Evaluation Engine (LEE) is a next-generation inference system built on phase-geometry logic. It delivers deterministic, reproducible, and measurable reasoning performance across Medical, Legal, and Defense, avoiding the statistical drift and opaque heuristics common in competing engines.

**■ Research Collaboration Opportunity — Neuroscience**
LEE's phase-geometry engine has produced toroidal low–high dimensional manifolds closely matching cortical grid-cell activity seen in Nature (2011, 2024), despite being developed independently of neuroscience models. Its counterfactual multi-object testing enables hypothesis generation that could point to as-yet unobserved cortical configurations.

**Core Innovations**
• Basis5 Phase Geometry mapping from material implication truth tables.
• Logical conservation laws incl. Logical Bianchi Identity.
• Quantitative metrics: StressIndex, Resistance, Winding.
• Provenance logging for audit and legal defensibility.
• Cross-domain transferability across verticals.

**Vertical Applications**
**Medical:** Detects manifold distortions, flags contradictory evidence integration.
**Legal:** Quantifies case health, provides full provenance chains.
**Defense:** Maintains reasoning stability under adversarial contradiction injection.

**Competitive Advantage**
LEE integrates alongside existing systems, outperforming in stability, auditability, and reproducibility.

**Funding Readiness**
Status: Fully functional, grant-ready, reproducible metrics and tests in public release.
Next Milestones: Time-weighted StressIndex, manifold distortion analysis, field pilots in verticals.