ARI Architecture Document

Aurora Research Initiative (ARI)

ARI Architecture (v1.0.0)

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Aurora Research Initiative (ARI) — ARI Architecture (v1.0.0)

The **Aurora Research Initiative (ARI)** serves as the institutional, governance, and epistemic foundation for the Aurora Workflow Orchestration ecosystem. This document defines ARI's structure, scope, responsibilities, authorities, and interaction boundaries with AWO, CRI-CORE, and scientific case studies.

ARI exists to prevent governance drift, ensure institutional clarity, and provide a stable foundation for reproducible AI-human scientific workflows.

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1. Institutional Positioning

ARI is positioned as the **organizational layer above all workflows and tooling**:

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Waveframe Labs (organization)
└── Aurora Research Initiative (institutional governance)
├── AWO — Method & execution workflow
├── CRI-CORE — Deterministic tooling engine (in development)
└── Scientific Case Studies
├── Waveframe v4.0 (cosmology)
└── Societal Progress Simulator
```

ARI governs **principles, oversight, identity, provenance, epistemic norms, and decision-making**. It does *not* execute workflows or implement tooling.

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2. Scope of ARI Governance

ARI defines and enforces the following areas:

2.1 Epistemic Norms

- audit-first reasoning
- falsifiability requirements
- metadata completeness
- provenancing rules
- transparency and interpretability standards

2.2 Governance Structure

- role separation
- approval boundaries
- oversight responsibilities
- independence of workflow execution

2.3 Identity & Integrity Anchoring

- identity rules
- attestation independence principles
- repository identity controls
- reproducibility guarantees

2.4 Documentation & Metadata Standards

- metadata block requirements
- artifact traceability
- documentation versioning
- diagram and schema rules

2.5 Lifecycle Policies

- evolution of AWO
- transition to CRI-CORE
- integration of case studies
- deprecation and archival behaviors

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3. ARI is *Not*

To maintain institutional clarity:

ARI is **not**: - a workflow
- a codebase
- an execution engine
- a model
- an experiment
- a scientific domain framework
- a personal blog
- a philosophical essay collection

ARI **does not**: - run workflows
- validate commits
- provide runtime logic

- generate artifacts
- execute scientific simulations

ARI **exists solely** to provide the rules, philosophy, and governance around these activities.

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4. Architectural Components

ARI consists of five primary components:

4.1 Governance Model

Defines the rules, roles, separation of concerns, and approval logic that govern the initiative.

4.2 Epistemic Doctrine

Establishes ARI’s scientific philosophy: - audit-first epistemology
- reproducibility as identity
- falsifiability as mandatory
- deterministic provenance

4.3 Institutional Interfaces

How ARI integrates with: - AWO (method) - CRI-CORE (tooling) - Case studies (research)

4.4 Metadata & Provenance Framework

Defines: - metadata blocks
- documentation structure
- artifact identity rules
- versioning and logging processes

4.5 Evolution & Roadmap

Outlines: - transition from AWO dominance to CRI-CORE tooling
- stability criteria
- ecosystem expansion
- long-term governance structure

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5. Interaction Boundaries

5.1 With AWO (Method)

ARI: - defines governance
- enforces epistemic standards
- sets metadata requirements
- dictates role separation rules

AWO: - implements workflows
- enforces determinism (temporary)
- conducts scientific execution

5.2 With CRI-CORE (Tooling)

ARI: - sets expectations for determinism
- defines provenance criteria
- governs versioning norms

CRI-CORE: - implements deterministic execution logic
- enforces identity binding
- provides the reproducibility engine

5.3 With Scientific Case Studies

ARI: - provides epistemic rules
- ensures falsifiability and auditability
- defines metadata structure

Case studies: - apply the standards
- generate research artifacts
- produce domain-specific results

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6. Stability & Maturity Phases

ARI evolves in distinct phases:

Phase 1: Foundational Architecture

(You are here) - establish governance
- create initial documents
- define structure

Phase 2: Integration with AWO

- enforce metadata rules
- define governance boundaries
- link ARI artifacts to AWO provenance

Phase 3: CRI-CORE Onboarding

- transition enforcement from AWO to CRI
- formalize deterministic runner requirements

Phase 4: Institutional Maturity

- public documentation
- licensing decisions
- stability audits
- reproducibility certification

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7. Revisions & Amendments

All architectural changes must: 1. be logged in `logs/GOV_LOG.md`
2. include version increments
3. maintain backward linkage
4. be approved through ARI governance rules

No architectural changes may be made silently.

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8. Contact & Identity

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This document establishes the initial institutional architecture of ARI. Future versions will add diagrams, decision logic, metadata schemas, and governance rules.
