

# Aurora Research Initiative (ARI)

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### 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**:

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.

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