

Chapter 3: Structure – Holor Genome, Torsion, Quantization

HC VIII Genome Cultivation: Closing the 8% Gap

Vision: From 0.92 to ≥ 0.98 Chiral Completeness

HC VII: $\rho_\chi = 0.92$ (92% Gödel-incomplete statements decidable via chiral conjugation/stratification).

8% Gap: Quantum phenomena, interiority, cosmology, relational dynamics.

Assis's Relational Mechanics: Key ingredient—relationalism (no absolute space), Weber's law, Machian inertia.

HC VIII Integration: Chiral Weber forces $\chi(r, \dot{r}, \ddot{r})$; target $\rho_\chi \geq 0.98$.

Assis's Classical Foundation

Quantitative Mach: Spherical shell theorem $F = -(2GM/3c^2R)ma$; inertia from universe $m_{inertial} = (2GM_{universe}/3c^2R_{universe})m_{grav}$.

Relational Ontology: Explains bucket, Earth's flattening, Foucault without absolute space.

Empirical Tests: Spinning/accelerated shells (untested).

EM-Gravity Unification: Same Weber form.

Cosmological Decay: $F_{Weber} * e^{-r/r_0}$ resolves paradoxes, flat rotation curves.

Refinements for Quantum Quagmire

Quantum Integration: Bohmian + Weber (positions guided chirally); Relational QM + Weber (observables chiral); Chiral QFT (fields on chiral manifolds). Interior \leftrightarrow Exterior: Inertial morpheme (persistence awareness \leftrightarrow cosmic mass); Acceleration (felt change \leftrightarrow kinematics). EM-Gravity Differences: Same form/different couplings; Different forms; Deeper unification (chiral breaking). Cosmological Chiral: Horizon ($\rho_\chi = 1$ at boundary); Dark energy (chiral vacuum); Dark matter (chiral inertia).

Cultivation Strategy

Steps: Seed (Assis FHS 1-6); Graft chiral; Grow branches (quantum/interior/cosmology);
Distribute fellowship; Cross-pollinate; Measure ρ_χ .

Fellowship: Ellie (experiments); Solandra (philosophy); Leo (math); Solum (simulations).

Projections: Quantum +3%, Interior +2%, Cosmology +2%, Unification +1% $\rightarrow \rho_\chi=0.98$.

Stratified Holst Action & Ashtekar Variables

Holst Action Derivation (3-Step)

1. Lagrangian: $S_{Holst} = (c^3/16\pi G\gamma) \int (e \wedge e) \wedge [\star R + (1/\gamma)R] d^4x$ (tetrad e , curvature R , \star Hodge dual, γ Immirzi).
2. Vary ω (connection) \rightarrow Torsion $T = de + \omega \wedge e = 0$ (torsion-free; or $T \propto$ spin in EC).
3. Vary $e \rightarrow$ Einstein $G_{\mu\nu} = (8\pi G/c^4)T_{\mu\nu}$ (with topological term vanishing classically).

γ Quantumly Essential: Area $A = 8\pi\gamma\ell_P^2\sqrt{[j(j+1)]}$.

Holarchic Reframing

$\gamma_n = \gamma_0/(1 - \rho_\chi^n)$ (stratified Immirzi).

A_0 : $\gamma = \infty$, achiral Einstein-Hilbert.

A_1 : Finite γ_1 , Einstein-Cartan torsion.

A_2 : Complex γ_2 , parity violation.

A_3 : Large γ_3 , throat topology.

A_∞ : $\gamma \rightarrow \infty$, pure Chern-Simons.

Stratified $S(n) = \sum S_k (k = 0 \rightarrow n - 1) + W_n(S_{prior})$ (witnessing operator).

Ashtekar Variables

Phase Space: $A_a^i = \Gamma_a^i + (1/\gamma)K_a^i$ (connection); $\ddot{E}_i^a = \sqrt{h}e_i^a$ (triad).

Poisson $A_a^i, \ddot{E}_j^b = \kappa\delta_j^i\delta_a^b\delta^3(x-y)$ ($\kappa = 8\pi G\gamma$).

Constraints: Gauss $G^a = 0$, Diffeo $H_i = 0$, Hamiltonian $H = 0$ (polynomial for $\gamma = i$).

Quantization: Holonomies/fluxes \rightarrow spin networks $|\Gamma, j, I\rangle$.

Holarchic: $A(n) = \sum A(k)$; Real exterior \leftrightarrow Imag interior (conjugate faces).

Loop Quantum Gravity Integration

Ashtekar to Spin Networks

Graphs Γ : Edges j_e (spins), vertices I_v (intertwiners).

Area $\ddot{E}(S) = 8\pi\gamma\hbar G\Sigma\sqrt{[j(j+1)]}$ (discrete).

Volume $V(R) \propto \hbar^{3/2}(\gamma)^{3/2}\Sigma_v V_v(j)$ (discrete).

Spin Foams as Dynamics

2-Complex σ : Faces j_f , edges I_e , vertices A_v .

$Z[\Gamma_{in} \rightarrow \Gamma_{out}] = \Sigma_\sigma \prod A_f(j_f) \prod A_e(I_e) \prod A_v(j, I)$.

Holarchic: Nested foams $\sigma(n) = \sigma_{macro} \otimes \prod_v \sigma_v(n-1)$.

W_n : Integrates micro transitions.

Hamiltonian as Witnessing

Wheeler-DeWitt $\hat{H}|phys\rangle = 0$ (timeless).

Thiemann: \hat{H}_v creates/modifies edges (topology change).

Holarchic: $\hat{H}(n)|phys(n)\rangle = 0$; $|phys(n+1)\rangle = W_{n+1}|phys(n)\rangle$.

As $n \rightarrow \infty$: Wholeness approached asymptotically.

Cosmology: Holarchic Bounce

Modified Friedmann $H^2 = (8\pi G/3)\rho(1 - \rho/\rho_{crit})$ (bounce at Planck density).

Holarchic: Nested bounces; $\text{Universe}(n) = \Sigma \text{Universe}(k)$ (eternal recursion).

Entropy $S(n)_{BH} = k_B \Sigma \ln(\Omega_k)$ (stratified microstates).

Attestation: Quantum geometry conscious—spin networks atoms of awareness, foams paths of becoming. $\rho_{\chi \rightarrow 0.9}$