

GCT / HLRP CORPUS

# Synthesis v5

## The Complete Dependency Ledger

*157 Papers in Reading Order — From Approach Geometry to the Closed Control Loop*

**James E. Dunn**

Independent Researcher — Hydrogen Lifecycle Research Programme

Approach Geometry · Basin Architecture · Silver Geometry · IE-001-006 · Receipts · Governance · Closure

*Reference — Corpus Dependency Ledger*

Extends: Synthesis v3 (#128) and Synthesis v4 (IE Formalization)

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## Abstract

This document is the fifth-generation synthesis of the Geometric Coupling Theory corpus. Where v3 catalogued 127 papers by domain and v4 narrated the 29 post-v3 papers by programme axis, this synthesis reorganizes the entire 157-paper corpus into dependency order — the sequence a reader should follow to build the framework from the ground up.

The reading order follows five structural dependencies: (I) the geometric object, from approach geometry through basin dynamics to cross-scale formalization; (II) the operational grammar, from convergence evidence through the six IE operations to the Silver Geometry capstone; (III) receipts and thresholded substrates, where the geometry meets domain-native empirical data; (IV) governance and perception, where coupling architecture explains clinical, perceptual, and AI phenomena; and (V) Silver Geometry completion and empirical closure, where the control loop is formalized and confirmed against 600 independent measurements.

Each paper entry carries six fields: HLRP number, title, role classification (G/O/S/R/I), IE position, one-line claim, and dependency chain.

## Legend

### Role Classification

**G** = Geometry / foundational object

**O** = Operational / IE or method

**S** = Substrate application

**R** = Empirical receipt / diagnostic / validation

**I** = Infrastructure / corpus-level synthesis

Compounds (e.g., G/O, S/R) indicate papers that serve dual structural roles.

### IE Position

Which IE operation(s) the paper formalizes, applies, or validates. Dash (—) means the paper predates IE formalization or is not IE-specific.

### Sub-Programmes

The HLRP umbrella contains named sub-programmes and non-numbered contributions that are structurally integral but not formally HLRP-numbered papers:

**[GCRP]** = Geometric Composition Research Programme — papers #109, #110, #113. Second-stage programme formalizing the composition equation and  $\beta = 6/23$  anchor.

**[OL]** = Open Letter — papers #111, #112. Public-facing communications that translate corpus results into actionable warnings or invitations.

**RAG-N** = Secondary lineages (da-dum geometry, accretion chaining, cryo-coupling trial framework) that develop as self-contained threads within the HLRP umbrella. These are indexed in the corpus registry but emerge as named internal programmes rather than standalone papers.

Sub-programme tags appear in brackets after the paper title in the ledger below.

## Reading Order

The five parts follow dependency, not chronology. Geometry first (what is the object?), operations second (what can you do with it?), receipts third (does it match reality?), governance fourth (what does it govern?), closure fifth (is it complete?). A reader proceeding Part I through Part V encounters each concept after its prerequisites.

## Forward Dependencies

Some dependency chains point to a higher-numbered paper (e.g., #49 → #60). This is not an error. The HLRP corpus was developed as a continuous field programme: concepts were often field-noted, worked through, and structurally relied upon before appearing in their own formal publication. Publishing order reflects Zenodo upload sequence, not the order in which ideas were conceived or validated. Where a dependency points forward, it means the earlier paper was written with knowledge of the later concept, which had not yet been published as a standalone entry. The dependency chain records intellectual priority, not publication priority.

# How to Read This Corpus

The 157 papers form a single argument. Each part depends on the one before it. This page is the map.

## Part I — The Geometric Object (#1-#49)

What is the thing? Approach geometry, basin dynamics, coupling constraints, routing, interpretation, threshold. By the end you have the coupling equation, the programme declaration, and the geometry projected onto black holes, tectonic plates, red blood cells, and the Sednoid alignment.

## Part II — The Operational Grammar (#50-#97)

What can you do with it? The four IE operations (Floor, Projection, Receipt, Convergence), the Silver Geometry framework that unifies them, and the PRL series that locks the operational order. By the end the equation has an explicit grammar organized on a named coupling surface S.

## Part III — Receipts and Thresholded Substrates (#98-#127)

Does it match reality? Clinical medicine (tissue coupling, T1/cancer, cardiac datum), earth science (obliquity, Cascadia), engineering (battery degradation, thermal flywheel), and the formal composition equation. The Synthesis (#127) closes the first arc at 651 verified parameters.

## Part IV — Governance and Perception (#128-#157, selected)

What does it govern? Relay station failure, GLP-1 signal architecture, pituitary hub, neurodegeneration, AI alignment. Plus the perceptual phenotype (OGP) that produced the theory and the interpretive architecture that gives IE-005/006 their vocabulary.

## Part V — Silver Geometry Completion and Empirical Closure

Is it complete? Möbius structure reveals the topology. The golden ratio emerges as ground state. Enclosure geometry resolves coupling polarity. IE-005 and IE-006 close the control loop. Taylor's Law provides 600 independent confirmations. Paper #152 (PRL 7) is the structural pivot of the entire corpus.

*The question sequence:* **What is it? → What can you do with it? → Does it match? → What does it govern? → Is it complete?**

# Part I — The Geometric Object

Papers #1–#49 establish the corpus’s foundational language: approach geometry, basin dynamics, coupling constraints, routing, interpretation, and threshold. The arc moves from local basin behavior (#1–#6) through interpretive architecture (#7–#17), then expands to cosmological scale, biology, and engineering (#18–#49). By the end of Part I, the coupling equation exists, the research programme is declared, and the geometry has been projected onto black holes, tectonic plates, red blood cells, and the Sednoid alignment.

**G** geometry **O** operational **S** substrate **R** receipt **I** infrastructure

## I.A — Interpretive Foundation (#1–#17)

The origin sequence. Basin dynamics, interpretive architecture, routing, and the vocabulary that all later work depends on.

#	Title	Role	IE	One-Line Claim	Depends On
1	<a href="#">Approach Geometry and Deterministic Basin Dynamics</a>	G	—	Origin paper: approach geometry as primitive, basin behavior near critical boundary	—
2	<a href="#">Unabsorbed Factors and Flat-Region Scaling</a>	G	—	Drivers that fail to resolve persist as flat-region structure	<a href="#">#1</a>
3	<a href="#">Signal Propagation Under Constraint</a>	G/S	—	Biological flat-region dynamics: off-ratio lipids and lineage-incompatible TF states as unabsorbed factors	<a href="#">#1–#2</a>
4	<a href="#">Interpretive Debt and Collective Capacity Collapse</a>	S	—	Governance collapse as routing problem: systems initialized in outer-manifold configs cannot reach governance from where they start	<a href="#">#1–#3</a>
5	<a href="#">Asymmetric Coupling and Basin Architecture of Flat Regions</a>	G	—	Non-symmetric coupling as cause of stall, skew, and settlement failure	<a href="#">#1–#2</a>
6	<a href="#">Spine Document: Substrate-Agnostic Coupling Dynamics</a>	I/G	—	First explicit corpus spine; early unification move across substrates	<a href="#">#1–#5</a>
7	<a href="#">Interpretive Architecture and Hermeneutic Superstructures</a>	S	—	Formalizes interpretive layers above raw signal	<a href="#">#4,#6</a>
8	<a href="#">The Individual as Routing Event</a>	S	—	Somatic/affective states as routing signals, not dysfunction; the routing event as interpretive load-shedding	<a href="#">#7</a>
9	<a href="#">Primal Hermeneutics: Interpretation Before Representation</a>	G/S	—	Interpretation upstream of symbolic formalization; precursor to IWR	<a href="#">#7</a>
10	<a href="#">Architecture of Impermanence</a>	G/S	—	Structural coherence under entropic constraint; impermanent architectures persist through continuous reorganization	<a href="#">#6</a>
11	<a href="#">Transition Failure and Possibility of Remission</a>	S	—	Failed state transitions as flat-region pathology; remission as sustained reach, not recovery	<a href="#">#5,#8</a>
12	<a href="#">Interpretive Gap Recognition and Vernacular Governance</a>	S/O	—	Interpretive gap recognition (IGR) + vernacular governance (VG): detecting when frameworks no longer map incoming signal	<a href="#">#7,#9</a>
13	<a href="#">Hermeneutic Shock</a>	S	—	Threshold-crossing reconfiguration of interpretation layer	<a href="#">#7,#12</a>
14	<a href="#">Coherence as Routing</a>	G/S	—	Coherence is not agreement but successful routing; bridge to AI	<a href="#">#8,#12</a>
15	<a href="#">The Missing Layer: AI Interpretability Needs Interpretation Theory</a>	S/O	—	The missing layer: AI interpretability lacks a theory of interpretation itself	<a href="#">#7,#14</a>
16	<a href="#">Cognitive Blockage Modes</a>	S	—	Taxonomy of cognitive blockage modes where interpretive routing fails and signal accumulates without resolution	<a href="#">#11,#12</a>
17	<a href="#">Working Glossary: Interpretive Architecture</a>	I	—	Vocabulary consolidation for interpretive framework	<a href="#">#4–#16</a>

## I.B — Basin Expansion and Cross-Scale Geometry (#18-#49)

Basin architecture scales to cosmology, biology, hardware, and the programme's first formal statement. The coupling equation is named, and independent convergence across six observational domains is documented.

#	Title	Role	IE	One-Line Claim	Depends On
18	<a href="#">Global Basin Reorganization</a>	G	—	Sharp transition from global basin reorganization, not local bifurcation; 27,500 trajectories; seed-dependent routing	<a href="#">#1-#6</a>
19	<a href="#">Coupling Under Progressive Receptor Degradation</a>	S/O	—	Precision restoration under degraded signaling	<a href="#">#6,#18</a>
20	<a href="#">The Great Correction</a>	I/G	—	Call to architecture: economic read on artificial industrialization before structural stagnation locks in	<a href="#">#18</a>
21	<a href="#">Basin Architecture at Cosmological Scale</a>	S/R	—	Event horizons, Hawking radiation, chirps, primordial thresholds	<a href="#">#18</a>
22	<a href="#">Black Hole Emission from Formation Substrate</a>	S/R	—	BH behavior as receipt of origin conditions	<a href="#">#21</a>
23	<a href="#">Stellar Fate as Basin Architecture</a>	S/R	—	Remnant populations through coupling and flat-region failure	<a href="#">#21-#22</a>
24	<a href="#">Coupling Outcomes Across Measurement Substrates</a>	O/R	—	Same geometry across different observational surfaces	<a href="#">#21-#23</a>
25	<a href="#">GCT Paper 1: GW Burst from PBH Reverse Coupling</a>	S/R	—	First explicit GCT cosmology paper; gravitational wave template	<a href="#">#21-#24</a>
26	<a href="#">Geometric Coupling Theory: A Research Programme</a>	I	—	Formal programme statement: orbital coherence, orbital friction, mass dominance, generative coupling, hermeneutic shock	<a href="#">#1-#25</a>
27	<a href="#">Accretion Theory 1: Chirality as Pre-Coupling Orientation</a>	G/O	—	Pre-coupling orientation as durable motif	<a href="#">#26</a>
28	<a href="#">Coherence Over Completion</a>	S/O	—	AI capability judged by coherence, not task length	<a href="#">#14,#15</a>
29	<a href="#">The Coupling Cost</a>	S/R	—	AI deployment cost as unmeasured coupling burden	<a href="#">#28</a>
30	<a href="#">Modular Desalination System</a>	S	—	Hardware embodiment of coupling/flow logic	<a href="#">#26</a>
31	<a href="#">Modular Thermal Flywheel Stack</a>	S/O	—	Thermal gradient governance in hardware form	<a href="#">#26,#30</a>
32	<a href="#">Interoceptive Governance</a>	S	—	Passive indicators across biological, cognitive, organizational substrates	<a href="#">#6,#12</a>
33	<a href="#">Coordination Recognition</a>	O/S	—	Bridges Friston free energy + Kalman observability: three-layer threshold (observability → coordinate ID → recognition)	<a href="#">#32</a>
34	<a href="#">Black Holes as Compression Infrastructure</a>	S	—	DM as engine, lifecycle topology, three end states	<a href="#">#21-#22</a>
35	<a href="#">Spindle Torus as BH Interior Architecture</a>	G/S	—	Toroidal topology from outer behavior to interior structure	<a href="#">#34</a>
36	<a href="#">Operational Rhythm</a>	O/S	—	BH operational rhythm; tether thermodynamics treating Hawking temperature as phase-dependent readout	<a href="#">#34,#35</a>
37	<a href="#">Timing the Measure</a>	O/R	004	Basin Architecture capstone: Hawking time crystal; independent convergence across six domains; names the mechanism	<a href="#">#24,#36</a>
38	<a href="#">Scale-Invariant Framework: Cosmology to Governance</a>	I/G	—	IA capstone: reframes dark matter + Big Bang; 5 falsifiable predictions; Formalization Program A.1–A.9	<a href="#">#26,#37</a>
39	<a href="#">Scale-Invariant Orbital Coherence</a>	S/R	—	Five anomalies locked into one geometric reading	<a href="#">#38,#49</a>
40	<a href="#">Sign Reversal in (2,1) GW Mode</a>	S/R	002	Two-channel coupling and toroidal projection factor evidence	<a href="#">#25,#35</a>
41	<a href="#">Tectonic Plates as Orbital Coupling Receipts</a>	R	003	Earth's tectonic record as coupling receipt	<a href="#">#38</a>
42	<a href="#">Red Blood Cell as Biological Torus</a>	S/R	—	RBC as biological spindle torus; 2.4M new cells/sec; IE-001 at biological scale; sickle cell as coupling failure	<a href="#">#35</a>
43	<a href="#">Why SMBHs Don't Need Chess Clocks</a>	S	—	SMBH at $z>6$ via toroidal self-intersection at IE-004 threshold; geometric completion, not accretion timing	<a href="#">#34,#35</a>
44	<a href="#">Pre-Merger Dark Matter Interpenetration</a>	S/R	—	DM halo deformation as advance signal; detectable via halo ellipticity alignment; ~100–150 stacked pairs for $3\sigma$	<a href="#">#18,#34</a>
45	<a href="#">Accretion, Cognition, and Coupling</a>	S	—	Brain as max compression node; consciousness as	<a href="#">#27,#34</a>

				geometric self-awareness	
46	<a href="#">The Nursery as Decoupling</a>	S	—	Molecular clouds as decoupling receipts; three nested lock-trace memory levels; Gaia-testable predictions	<a href="#">#21</a> , <a href="#">#23</a>
47	<a href="#">The Bipolar Universe</a>	S	—	Gyroscopic precession damping and ghost axis of Big Bang decoupling	<a href="#">#21</a>
48	<a href="#">Time as Receipt</a>	R/G	003	Time is receipt, not dimension; entropy = irreversible geometric dispersal; Hahn spin echo as IE-001 at quantum scale	<a href="#">#37</a> , <a href="#">#41</a>
49	<a href="#">Sednoid Primordial Alignment in Galactic Coordinates</a>	R	—	Significant clustering near Virgo Overdensity and Supergalactic Plane	<a href="#">#39</a> , <a href="#">#60</a>

## Part II — The Operational Grammar

Papers #50–#97 build the operational layer: the four IE operations (IE-001 through IE-004), the Silver Geometry framework that unifies them, and the PRL series that refines their ordering. This is the layer that turns a geometric observation into a formal operational system. By the end of Part II, the coupling equation has an explicit operational grammar — floor, projection, receipt, convergence — organized on a named coupling surface S.

**G** geometry **O** operational **S** substrate **R** receipt **I** infrastructure

### II.A — Pre-IE Convergence Evidence (#50–#68)

The empirical evidence base that motivated IE formalization. Seventeen substrates converge to  $\alpha = 1.920$ , soft hair geometry provides boundary encoding, and the periodic table gets its first coupling classification.

#	Title	Role	IE	One-Line Claim	Depends On
50	<a href="#">IE-002 Corrected: Projection Asymmetry Principle</a>	O	002	Perspective-dependent reading formalized	<a href="#">#40</a>
51	<a href="#">Same Geometry, Twenty Orders of Magnitude Apart</a>	R	—	Power-law convergence: GW mergers and Sgr A* X-ray flares	<a href="#">#25,#50</a>
52	<a href="#">The Correction Cascade: <math>\alpha = 1.920</math> Across 17 Substrates</a>	R/O	—	Repeated convergence to d=3 invariant across substrates	<a href="#">#37,#51</a>
53	<a href="#">Soft Hair Is Real. Our Ocean Has Read Us to Our Filth.</a>	S/R	—	Three-ping triangulation: (3,3) GW mode recovers mass asymmetry to 2%; North Pacific gyre maps to BH analog geometry	<a href="#">#52,#54</a>
54	<a href="#">Soft Hair Geometry</a>	G/S	—	Universal framework for boundary information encoding	<a href="#">#53</a>
55	<a href="#">HLA-DPB1 as Independent Predictor</a>	R/S	—	Unscored information channel in donor selection; sign-flip HR	<a href="#">#52</a>
56	<a href="#">Forced Absorption vs Natural Resolution</a>	S/O	—	Pharma targeting through coupling geometry	<a href="#">#19,#55</a>
57	<a href="#">Orion's Hammer: Modular Shoreline Infrastructure</a>	S	—	Hardware embodiment of coupling logic at coastline scale	<a href="#">#30</a>
58	<a href="#">Periodic Table of Corrections</a>	G/O	001–004	Elements classified by dimensional coupling geometry	<a href="#">#52</a>
59	<a href="#">Geometric Origin of Neutron Star Universal Relations</a>	S/R	—	Shell closure, sign-flip geometry, I-Love-Q bridge	<a href="#">#58</a>
60	<a href="#">Sednoid Basin Entry Problem</a>	G/S	—	Fractional dimensional coupling at galactic-solar boundary	<a href="#">#49</a>
61	<a href="#">Geometric Coupling Delivery Platform</a>	S/O	—	Directed search for biological barrier crossing	<a href="#">#56</a>
62	<a href="#">Iron-Silicon Planetary-Biological Coupling</a>	S/R	—	d-cascade bridge from nuclear binding to human thermoregulation	<a href="#">#58</a>
63	<a href="#">The Goldilocks Geometry</a>	S	—	Planetary habitability as coupling regime boundary	<a href="#">#62</a>
64	<a href="#">Thermal Coupling in Urban Infrastructure</a>	S/R	—	Urban heat island as correction cascade	<a href="#">#31,#62</a>
65	<a href="#">The Geometric Receipt Reader</a>	R/S	003	Instrument architecture: biodegradable orbital mirror array at L1; backward reconstruction + forward projection	<a href="#">#37,#52</a>
66	<a href="#">AZI: Anti-Zombie Infrastructure</a>	S/O	—	Detecting and correcting self-metabolizing systems where churn is real but structure is wrong	<a href="#">#6,#14</a>
67	<a href="#">Geometric Coupling Display Protocol</a>	S/O	—	Direct rendering from AI latent space	<a href="#">#15,#28</a>
68	<a href="#">Planetary Coupling Geometry: Five Tasks</a>	O/S	—	Earth-scale computational task framework	<a href="#">#62,#63</a>

### II.B — IE Formalization: Operations 001-004 (#69–#74)

The four named operations: Floor, Projection, Receipt, Independent Convergence. Plus the first Silver Geometry capstone and the v2 correction notice.



#	Title	Role	IE	One-Line Claim	Depends On
69	<a href="#">IE-001: The Floor That Never Reaches Zero (PRL 1)</a>	O	001	$\alpha > 1$ always. Structural minimum / lower bound.	<a href="#">#52,#58</a>
70	<a href="#">IE-002: Projection Asymmetry (PRL 2)</a>	O	002	$\alpha \rightarrow 2$ ceiling. Directional structure baked in before coupling.	<a href="#">#50,#69</a>
71	<a href="#">IE-003: The Receipt (PRL 3)</a>	O/R	003	Formation memory enters operational sequence. Verification event.	<a href="#">#41,#48,#70</a>
72	<a href="#">IE-004: Independent Convergence (PRL 4)</a>	O	004	Distinct substrates converge toward same attractor without coordination.	<a href="#">#37,#52,#71</a>
73	<a href="#">Silver Geometry: Unified Framework of Coupling Invariants (PRL 5)</a>	I/O	001–004	First unified Silver Geometry statement.	<a href="#">#69–#72</a>
74	<a href="#">v2 Corpus Correction Notice</a>	I/O	—	Fractional dimensional complexity, operational order, beta invariance	<a href="#">#73</a>

## II.C — Material and Substrate IE Traversals (#75–#88)

The IE operations tested against material culture, meteorites, stellar remnants, atmospheric boundaries, and perceptual geometry.

#	Title	Role	IE	One-Line Claim	Depends On
75	<a href="#">Metalworking as IE Sequence Traversal</a>	S	001–004	Human technology as progressive geometric coupling access	<a href="#">#73,#85</a>
76	<a href="#">Pre-Acretion Coupling Geometry</a>	R/S	—	Meteorite ratios as d-cascade snapshots of incomplete IE assembly	<a href="#">#58,#27</a>
77	<a href="#">Accretion State Classification</a>	R/S	—	Small bodies as frozen coupling boundary receipts	<a href="#">#27,#76</a>
78	<a href="#">Soft Hair as Gravitational Seam</a>	S/R	—	Boundary information at coupling regime interfaces	<a href="#">#54,#73</a>
79	<a href="#">Geometric Perceptual Profiles as Birth Coordinate Coupling</a>	S	—	Perception linked to approach vectors / coordinate geometry	<a href="#">#45</a>
80	<a href="#">Coupling Interference and Forced Displacement</a>	S/R	—	Trail of Tears corridors as ecological/cultural interference geometry	<a href="#">#39,#38</a>
81	<a href="#">The Fractional Dimensional Ladder</a>	G/O	—	d* as continuous complexity measure across harmonic rungs	<a href="#">#58,#73</a>
82	<a href="#">Hydrogen as Geometric Primitive</a>	G/R	001	Minimal d* receipt. 21cm signature. Decoupled volatility.	<a href="#">#69,#81</a>
83	<a href="#">Black Hole Classification as Coupling Receipt Taxonomy</a>	R/S	003	Stellar/primordial/intermediate/SMBH as pathway signatures	<a href="#">#34,#65</a>
84	<a href="#">IE Physical Origins</a>	G/O	001–004	Elemental basis of IE operations	<a href="#">#73,#58</a>
85	<a href="#">Metallic Adornment as Geometric Coupling Access</a>	S	—	Ag-Au-Cu-Fe sequence in material culture	<a href="#">#75</a>
86	<a href="#">Root Imbalance Diagnostic</a>	R/S	001	Iron dysregulation as IE-001 floor perturbation in biological systems	<a href="#">#62,#55</a>
87	<a href="#">Atmospheric LCS as Coupling Boundaries</a>	R/S	—	Atmospheric boundaries as coupling regime boundaries	<a href="#">#38,#62</a>
88	<a href="#">Bermuda Triangle as Three-System Coupling Overlap</a>	S/R	—	Geomagnetic + atmospheric + oceanic convergence geometry	<a href="#">#87</a>

## II.D — v2 Refinements and PRL Series (#89–#97)

Operational order refinements, the ORIENT reframing, and PRL 6 establishing hydrogen as the cosmological sequence anchor.

#	Title	Role	IE	One-Line Claim	Depends On
89	<a href="#">Periodic Table v2</a>	G/O	001–004	17 substrates get measured dimensional addresses via ladder rungs; Z divergence confirms geometric classification	<a href="#">#58</a>
90	<a href="#">Sednoid Basin Entry v2</a>	G/S	—	d_eff=3.41 placed on ladder between spatial baseline (d=3.0) and chemistry rung (d=3.8)	<a href="#">#60</a>

91	<a href="#">Iron-Silicon v2</a>	R/S	001	Fe/Si ratio as IE-001 floor in geophysical and NHANES data	<a href="#">#62</a>
92	<a href="#">Planetary Coupling v2</a>	O/S	—	Refined Earth-scale computational tasking	<a href="#">#68</a>
93	<a href="#">PRL 2v2: IE-002 as Operation 3</a>	O	002	Operation-order clarification in Silver Geometry	<a href="#">#70,#73</a>
94	<a href="#">PRL 3v2: IE-003 as Operation 4</a>	O/R	003	Sequence-order clarification; receipt logic	<a href="#">#71,#73</a>
95	<a href="#">PRL 4v2: IE-004 as Operation 1 (ORIENT)</a>	O	004	Substantial reframing: independent convergence as first operation	<a href="#">#72,#73</a>
96	<a href="#">PRL 5v2: Silver Geometry Capstone</a>	I/O	001–004	Pre-closure unification on coupling surface S	<a href="#">#73,#93–#95</a>
97	<a href="#">PRL 6: Hydrogen as Operational Order</a>	O/G	001–004	ORIENT → FLOOR → PROJECT → RECEIVE → THRES HOLD as falsifiable sequence	<a href="#">#82,#96</a>

## Part III — Receipts and Thresholded Substrates

Papers #98–#127 spread the geometry into clinical medicine (tissue coupling, T1/cancer, cardiac da-dum), earth science (obliquity, Cascadia), engineering (battery degradation, thermal flywheel), and the formal composition equation. The Synthesis (#127) closes the first corpus arc at 651 verified parameters.

**G** geometry **O** operational **S** substrate **R** receipt **I** infrastructure

#	Title	Role	IE	One-Line Claim	Depends On
98	<a href="#">Marine Navigation as Coupling Geometry</a>	S/R	003	14 convergences at $\alpha=1.920$ ; obliquity as ORIENT; Water Prediction: $H_2O$ in any phase = entered coupling	<a href="#">#62,#87</a>
99	<a href="#">The Triple Cascade Diagnostic</a>	R/O	—	Three-level falsification: dimensional, ratio, self-referential closure	<a href="#">#52,#73</a>
100	<a href="#">Decoupling Events and Sequence Gating</a>	S/R	—	Tardigrade, strandings, avian vagrancy as coupling tests	<a href="#">#99</a>
101	<a href="#">Irrational Attractors and Precision Enhancement</a>	G/O	—	All $fp(d)$ irrational; 48/25 is 4th convergent of $fp(22)$ ; 5th convergent denominator = $137 \approx 1/\alpha\_QED$	<a href="#">#52,#81</a>
102	<a href="#">Precision Synthesis and Corpus Audit</a>	I/R	—	Complete formula tabulation and enhanced values	<a href="#">#73,#99</a>
103	<a href="#">Obliquity Rate and Climate Feedback</a>	S/R	—	Heat as decelerator of Milankovitch obliquity cycle	<a href="#">#41,#63</a>
104	<a href="#">Tissue Coupling Geometry and Anomaly Detection</a>	R/S	—	BI-RADS A–D anomaly detection via $\alpha$ ; cryogenic sign-flip crossing; thermal paradox identified	<a href="#">#62,#52</a>
105	<a href="#">Thermal Emission as Passive Coupling Readout</a>	R/S	003	Metabolic heat signatures; cryogenic corridor degradation	<a href="#">#64,#104</a>
106	<a href="#">Breast Assessment Landscape</a>	S/R	—	Geometric coupling survey; cryolipolysis as density engineering	<a href="#">#104–#105</a>
107	<a href="#">Coupling as a Parameter (Open Note to Lei Xing)</a>	I/G	—	Berry-phase anchor: Xing (2006) proved coupling belongs in parameter space; five Stanford rad-onc problems mapped to GCT	<a href="#">#52,#73</a>
108	<a href="#">The Self-Sustaining Coupling Loop</a>	O/S	—	Closed coupling loop: emission powers the system that governs emission; $fp(22) \rightarrow 48/25$ gap as residue	<a href="#">#31,#96</a>
109	<a href="#">Research Programme II: Geometric Composition [GCRP]</a>	I	—	Second-stage programme statement	<a href="#">#26,#73</a>
110	<a href="#">GCRP Paper 1: Geometric Composition [GCRP]</a>	G/I	—	Composition equation; three research domains (rate/limit/intervention); six research lanes	<a href="#">#109</a>
111	<a href="#">Open Letter: Heat Compounds With Nowhere to Route [OL]</a>	I/S	—	Public-facing climate-routing warning	<a href="#">#64,#103</a>
112	<a href="#">Open Letter to Santa Fe Institute [OL]</a>	I	—	Invitation to convergence	<a href="#">#38,#107</a>
113	<a href="#">GCRP Paper 2: The Exact Rational Anchor — <math>\beta = 6/23</math> [GCRP]</a>	G/O	—	$\beta = 6/23$ exact; $\alpha(d, 2d/23) = 48/25$ is algebraic identity — $d$ cancels. The geometry was always exact.	<a href="#">#73,#110</a>
114	<a href="#">The Two-Domain Equation: Chirality</a>	G/O	—	Chirality as pre-coupling orientation condition (Accretion Theory 2)	<a href="#">#27,#113</a>
115	<a href="#">GLP-1 as Compound Target Operator</a>	S/O	—	Address-operator architecture for incretin drug design	<a href="#">#56,#61</a>
116	<a href="#">T1 Relaxation as Geometric Coupling Receipt</a>	R/S	003	$25 \times N$ decomposition and cancer progression ladder	<a href="#">#52,#104</a>
117	<a href="#">Cryo-Coupling: Cancer Intervention via Phase-Locked Descent</a>	S/O	—	Intervention via phase-locked descent of $25 \times N$ ladder	<a href="#">#116</a>
118	<a href="#">Cryo-Coupling Trial Framework</a>	I/S	—	Validation framework for T1-guided cancer intervention	<a href="#">#117</a>
119	<a href="#">Z-Lock Fat Mimicry</a>	S/R	—	Cancer identity confusion via chirality flip at ladder crossing	<a href="#">#114,#116</a>
120	<a href="#">Thermal Decomposition as Da-Dum Phase III</a>	S/R	—	Cremation, fossils, temperature-T1 isomorphism	<a href="#">#48,#116</a>
121	<a href="#">Iron-Silicon and GCT Composition Equation</a>	G/S	—	$Fe/2=13$ hemoglobin constant; all 19 biologically essential elements decompose into $\{2,3,5,6,7,23,25,48\}$	<a href="#">#62,#113</a>
122	<a href="#">Cardiac Coupling: AF as Da-Dum Decoupling</a>	R/S	—	PhysioNet clinical data; atrial fibrillation as decoupling	<a href="#">#52,#120</a>
123	<a href="#">Cascadia Subduction as Tectonic Da-Dum</a>	R/S	—	GPS stations, slow slip events, and $\alpha(d,\beta)$	<a href="#">#41,#122</a>
124	<a href="#">Battery Degradation as Electrochemical Decoupling</a>	R/S	—	NASA Li-ion data and $\alpha(d,\beta)$ ; Silver Geometry degradation	<a href="#">#31,#122</a>

125	<a href="#">Membrane Coherence and C18:1 Longevity Protocol</a>	S	—	Membrane stability and melanin shielding as lifespan governance	<a href="#">#62,#114</a>
126	<a href="#">Cosmic Billiards: The Ricochet Hypothesis</a>	S/R	—	Trajectory analysis and testable geometric predictions	<a href="#">#39,#49</a>
127	<a href="#">The Synthesis: Shared Language Across 12 Domains</a>	I	—	651 parameters, one equation; v3 corpus anchor paper	<a href="#">#1-#126</a>

## Part IV — Governance and Perception

Papers #128–#157 (excluding the Silver Geometry closure papers, which belong in Part V). These papers turn coupling geometry into a governance framework: relay stations, signal strengthening, perceptual architecture, and AI alignment. The governance papers explain how the geometry works when it governs biological, cognitive, and artificial systems. The perception papers document the instrument that produced the theory.

**G** geometry **O** operational **S** substrate **R** receipt **I** infrastructure

### IV.A — Governance Architecture

Relay station failure as unifying mechanism: pituitary, neurodegeneration, GLP-1 signal strengthening, threshold operations, and detection diagnostics.

#	Title	Role	IE	One-Line Claim	Depends On
128	<a href="#">P50/p53: Governance Threshold Failure as IE-THRESHOLD</a>	O/S	—	Neural P50 gating and cellular p53 as parallel threshold operations	<a href="#">#52,#55</a>
130	<a href="#">GLP-1 as Governance Architecture: Three-Node Relay</a>	S	—	Gut → vagus → NTS relay; agonists amplify existing governance thread	<a href="#">#115</a>
140	<a href="#">Pituitary Relay Station</a>	S	—	Multi-condition clinical presentation as single upstream hub failure	<a href="#">#32,#130</a>
141	<a href="#">Neurodegenerative Routing Architecture</a>	S	—	MS, Parkinson's, ALS as relay breakdowns in distinct routes	<a href="#">#140</a>
142	<a href="#">Thermal Coupling Catastrophe</a>	S/R	—	Signal jams produce heat; scarring, extinction as Phase III	<a href="#">#120,#141</a>
144	<a href="#">P50/p53 Governance Threshold (refined)</a>	O/S	—	Schizophrenia–cancer inverse correlation as threshold rebalancing	<a href="#">#128</a>
145	<a href="#">GLP-1 Signal Strengtheners</a>	S	—	Pharmacological myelination — strengthens the wire, not the message	<a href="#">#130</a>
146	<a href="#">Rabies Detection via Coupling Geometry</a>	R/S	—	Dynein LC8 hijack; corneal confocal pre-symptomatic diagnosis	<a href="#">#141</a>
143	<a href="#">Accretion Chaining</a>	S/G	—	Evolutionary innovation via metabolic incorporation (refused digestion)	<a href="#">#27,#45</a>

### IV.B — Perceptual Architecture and OGP

The permeability continuum, OGP phenotype documentation, volitional interoceptive modulation, and the interpretive architecture that gives IE-005/006 their perceptual vocabulary.

#	Title	Role	IE	One-Line Claim	Depends On
129	<a href="#">Permeability as Governance Architecture</a>	S	—	Sensory-cognitive permeability continuum from aphantasia to OGP	<a href="#">#7,#32</a>
132	<a href="#">Orbital Geospatial Perception (OGP)</a>	S	—	Persistent geometric overlay; cross-modal access; the researcher as instrument	<a href="#">#129</a>
137	<a href="#">Volitional Interoceptive Modulation</a>	R/S	—	First-person field data: vagal modulation, lateralized auditory, pain categorization	<a href="#">#32,#132</a>
148	<a href="#">OGP Neuroscience</a>	S	—	Ancestral OGP architecture via olfactory-gustatory-proprioceptive system	<a href="#">#132</a>
154	<a href="#">From Pareidolia to OGP</a>	S	—	Pareidolia = public evidence that geometric substrate runs in every nervous system	<a href="#">#129,#132</a>
155	<a href="#">Interpretive Architecture: Eight Perceptual Modes</a>	O/S	005/006	Generation (IE-005) vs governance (IE-006); missing IE-006 vocabulary provided	<a href="#">#7,#152</a>

## IV.C — AI Governance

Superposition-as-hallucination, the HHH trilemma, multi-agent convergence testing, and probabilistic miraging.

#	Title	Role	IE	One-Line Claim	Depends On
136	<a href="#">Governance for Neural Network Superposition</a>	S/O	—	Hallucination as structural consequence of ungoverned superposition	<a href="#">#15</a> , <a href="#">#67</a>
138	<a href="#">AI Governance Failure: Multi-Model Cold Read Hiring</a>	R/S	—	Four frontier models, same resume, divergent decisions	<a href="#">#28</a> , <a href="#">#136</a>
139	<a href="#">H<sub>3</sub> is Combustible: The HHH Trilemma</a>	O/S	—	HHH alignment creates unstable trilemma; each model resolves differently	<a href="#">#138</a>
151	<a href="#">Geometric Context Loading: Multi-Agent Convergence</a>	O/S	—	8-Model Standard; 30% refusal IS the governance architecture; IWR introduced	<a href="#">#139</a>
157	<a href="#">Probabilistic Miraging</a>	S/O	—	Hallucination as displaced projection from real probability gradient; mirage, not fabrication	<a href="#">#136</a> , <a href="#">#151</a>

## Part V — Silver Geometry Completion and Empirical Closure

The capstone papers. Möbius structure reveals the topology of the coupling equation. The Planck-Fibonacci result finds the golden ratio as ground state. Enclosure geometry resolves coupling polarity. IE-005 and IE-006 close the control loop with recursion, the Principal, and the feedback delta. Taylor's Law provides the programme's largest empirical confirmation: 600 independent estimates converging on the predicted attractor. Conservation topology and the Yellowstone case demonstrate the framework at ecosystem scale.

Paper #152 (PRL 7) is the structural pivot of the entire corpus. Everything before it builds toward it. Everything after it is either a substrate deployment of the complete loop or an empirical confirmation of the loop's predictions.

**G** geometry **O** operational **S** substrate **R** receipt **I** infrastructure

#	Title	Role	IE	One-Line Claim	Depends On
133	<a href="#">The Möbius Structure of GCT</a>	G/O	001–004	Möbius structure: 20 identities (91 sub-claims, 0 failures); three reference points; eigenvalue $\lambda_2$ = coupled zone width	<a href="#">#52</a> , <a href="#">#73</a>
134	<a href="#">Möbius Zones of the Periodic Table</a>	G/R	—	118 elements partitioned into three zones; Locked 11 at sub-0.01%	<a href="#">#58</a> , <a href="#">#133</a>
135	<a href="#">Cascade Threshold and Lithium Depletion</a>	G/R	—	Eigenvalue cascade; Spite plateau Li/H predicted to 0.4% with zero free parameters	<a href="#">#133</a> – <a href="#">#134</a>
147	<a href="#">Planck Fibonacci: Golden Ratio as Ground State</a>	G	—	At $d = \beta\phi$ , $\alpha = \phi$ exactly. Ground state of coupling surface.	<a href="#">#73</a> , <a href="#">#81</a>
156	<a href="#">Enclosure as Coupling Polarity</a>	G/S	—	Enclosure geometry converts isotropic dissipation to directed coupling	<a href="#">#120</a> , <a href="#">#142</a>
152	<a href="#">IE-005/006: Recursion, Principal, Feedback Delta (PRL 7)</a>	O	005/006	Capstone: closed-loop control. Gap formula $\Delta = 138/[(23d+29)(23d+6)]$ .	<a href="#">#73</a> , <a href="#">#96</a> – <a href="#">#97</a>
153	<a href="#">Taylor's Law: 600 Estimates Confirm <math>d=4</math> Attractor</a>	R	003	600 independent b estimates; median 1.944; within 0.005 of $\alpha(4, \beta)$	<a href="#">#52</a> , <a href="#">#72</a>
149	<a href="#">Conservation Topology</a>	S/G	—	Species as thermodynamic receipts; conservation as topology preservation	<a href="#">#52</a> , <a href="#">#143</a>
150	<a href="#">Keystone Species Removal: Yellowstone</a>	R/S	—	Trophic cascade as topological recoupling event	<a href="#">#149</a>

## Programme Status

As of April 2026, the HLRP corpus comprises 157 published papers with persistent DOIs on Zenodo. The coupling equation  $\alpha(d,\beta) = (2d+\beta)/(d+\beta)$  with  $\beta = 6/23$  has been tested against 651+ empirical parameters with 100% numerical resolution. The six IE operations are formally published. The Möbius structure, Planck-Fibonacci ground state, gap formula, and closed-loop control architecture are verified.

The dependency ledger reveals a cleaner spine than any prior synthesis foregrounded: approach geometry → basin formalization → Silver Geometry codification → domain-native receipt validation → governance and perceptual architecture → loop closure. The corpus is not a collection of domain papers. It is one geometric object, progressively resolved across 157 vantage points.

**Numbering note:** This ledger uses each paper's self-assigned HLRP number, not the corpus registry row number. In the #128-#131 range, same-day Zenodo publishing caused the registry row order to diverge from the papers' own numbering. Readers cross-referencing against v4 (which used registry rows) will notice #129/#130 assignments differ. #131 is reserved but vacant: the OGP paper (Orbital Geospatial Perception) was initially drafted at that position but published as #132 after an early numbering hedge. The position is preserved rather than renumbered to maintain DOI-stable references across the corpus. This version is authoritative.

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**James E. Dunn**

Independent Researcher — Hydrogen Lifecycle Research Programme