Manifold Relativity v10: Candidate Dirac Operator on the $\mathcal{W}$-Atlas

Entropy Waves / W-Manifold Programme

Preprint v10.0

Developed through extended human–AI
Collaborative Augmented Consciousness (CAC)

Human Node:
Paul E. Sorvik, Alexandria, Egypt
ORCID: 0009-0008-5717-7110

AI Builder Nodes (RLAF Architecture):
Claude Sonnet 4.6 (Anthropic) *Structural & Epistemic Logic*
Gemini (Google DeepMind) *Geometric Synthesis*

AI Referee Node:
ChatGPT (OpenAI) *CAC Referee / Analytical Reviewer*

Available: paulsorvik.wordpress.com

2026

Abstract

This tenth preprint of the Manifold Relativity programme transitions the framework from abstract kinematic postulates to an operational spectral geometry. Versions v1–v9 introduced the $\mathcal{W}$-manifold, the $\mathcal{W}$-atlas of observer-dependent charts, the observer-filter map $\mathcal{O}_T$, and the chart-local speed of time $\Upsilon = dS/d\tau|_{U_T}$. The present edition takes the next step by proposing the first candidate Dirac operator on that arena.

We model the local $\mathcal{W}$-space as a 4+2 fibered structure: a four-dimensional informational base (S, I, E, C) with working signature $(-, +, +, +)$, together with an

internal fiber (ϕ, A) (Working Geometric Assumption 2.1). On the corresponding Hilbert space $\mathcal{H}_{\mathcal{W}} := \ell^2(V(G_1)) \otimes \mathcal{H}_F$, where G_1 is the Planck-scale expander graph inherited from v3, we define the candidate bare operator $D_{\mathcal{W}}^{(0)} := D_{\text{base}} \otimes I_F + \gamma_5 \otimes D_{\text{fiber}}$. Observer access is formalised by a thermal spectral projector Π_T, treated here as a working ansatz, and the relation between spectral truncation and irreversibility is advanced only as Conjecture 6.1. No principal construction is promoted to established result without derivation. The paper therefore presents $D_{\mathcal{W}}^{(0)}$ not as a final object, but as a mathematically motivated candidate whose primary consistency test is whether the H-function κ-composition law of prior versions emerges from its truncated spectrum (Open Problem O31).

Contents

Empirical Motivation: Chart-Dependent Event Reconstruction

Modern high-energy physics already depends on a distinction between an underlying interaction event and the reconstructed event reported by a detector system. In standard practice, discrepancies between detectors or between detector runs are attributed to instrumental response, calibration drift, thermal noise, threshold effects, and reconstruction algorithms. This interpretation is correct at the engineering level and remains indispensable. However, it leaves open a deeper structural question: whether detector operating conditions, especially thermal baseline, are merely nuisance parameters obscuring a fixed event, or whether they also help determine which sector of the event is physically accessible to the observing system.

This question becomes particularly sharp in systems whose response is explicitly temperature-dependent. CMOS and related semiconductor detectors exhibit well-known changes in dark current, charge transport, timing jitter, noise floor, and threshold behaviour as temperature varies. Within conventional detector physics, these effects are modelled and, where possible, calibrated away so that different detectors converge on the same underlying event description. The present framework does not reject that procedure. Instead, it asks whether the success of calibration itself should be interpreted as a nontrivial transition map between observer conditions, rather than as proof that temperature is only extrinsic noise.

The $\mathcal{W}$-atlas framework proposes that an observer or detector at thermal baseline T occupies a chart U_T and accesses only a temperature-conditioned sector of the underlying spectral structure. Under this reading, thermal response is not merely an engineering imperfection but part of the observer map itself. Two detectors at the same collision event, operating at different effective temperatures, need not reconstruct identical fine structure even when they agree on coarse bulk quantities such as event existence, total deposited energy, or major correlation patterns. Any such discrepancy would first be expected in fine reconstruction: timing spread, channel fragmentation, inferred lifetime structure, or weak correlation sectors.

This leads to the central empirical motivation of v10. If temperature functions as a chart parameter rather than only a noise parameter, then the agreement between differently conditioned detectors is not trivial. It is the result of a transition map between charts, expected to approach the identity only when the spectral sectors resolved by the two detectors overlap sufficiently. In ordinary laboratory regimes, especially in present collider instrumentation, that overlap may be so strong that any residual is buried below standard calibration uncertainty. But in principle the framework predicts a controlled possibility: after known thermal response is modelled and corrected, one may still ask whether a systematic residual remains that tracks thermal baseline in a way not exhausted by conventional detector physics.

We use detector temperature dependence not as evidence that the $\mathcal{W}$-atlas has already been confirmed, but as a physically grounded entry point into the problem. The motivating conjecture is that event reconstruction may be chart-dependent. To make that statement calculable rather than philosophical, one needs the spectral object whose accessible sectors the observer-filter acts upon. That requirement is what forces the construction attempted in this paper: a candidate Dirac operator $D_{\mathcal{W}}$ on the $\mathcal{W}$-atlas.

Remark 1.1 (Scope of §1). This section provides empirical motivation only; it does not claim that known detector-temperature effects already constitute evidence for the $\mathcal{W}$-atlas. The vertical transformation $\Theta_{T_1 \to T_2}(x)$ — a transformation at fixed spatial support across observer conditions, distinct from the horizontal atlas transition maps τ_{ij} of v8 — is introduced here as a conceptual tool. Its formal definition is given in Section 5.

The Local $\mathcal{W}$-Arena: The 4+2 Fibered Signature

Prior editions of the Manifold Relativity programme treated the six informational coordinates (S, I, E, ϕ, C, A) as residing within a single global chart equipped with an implicit, uniform metric signature. However, attempting to force these six variables into a flat pseudo-Riemannian signature (e.g. a 6D Lorentzian manifold) generates severe physical contradictions.

Specifically, phase (ϕ) is a periodic, dimensionless angular variable associated with $U(1)$ gauge-like symmetry, and action (A) acts as the dynamical generator with dimensions of energy × time. Forcing a purely spacelike $(+,+)$ or timelike $(-,-)$ signature onto (ϕ, A) would induce an $SO(1,5)$ or $SO(2,4)$ spin group that misrepresents their established roles in quantum mechanics. To construct a rigorous geometric domain for the Dirac operator, we must decouple the extensive informational coordinates from the internal dynamical coordinates.

Working Geometric Assumption 2.1 (4+2 Fibered Split)**.** The six-dimensional $\mathcal{W}$-arena is modelled as a 4+2 fibered space, structurally analogous to a Kaluza-Klein gauge bundle or a Connes noncommutative finite-space extension [4]:

1. **The Base Informational Manifold ($\mathcal{W}_{\text{base}}$):** The coordinates (S, I, E, C) form a four-dimensional base space with the working pseudo-Riemannian signature $(-,+,+,+)$. Entropy (S) serves as the timelike coordinate, governing the emergent temporal flow $\Upsilon = dS/d\tau|_{U_T}$. Fisher Information (I), Entanglement (E), and Complexity (C) serve as spacelike coordinates defining structural magnitude.
2. **The Internal Fiber ($\mathcal{F}_{\phi,A}$):** The coordinates (ϕ, A) form an internal symplectic

or complex fiber over $\mathcal{W}_{\text{base}}$. Phase ($\phi$) is periodic ($U(1)$-like), and action ($A$) is provisionally taken as ϕ's internal dynamical partner. Neither is assigned an ordinary spacelike or timelike Lorentzian sign at first pass.

This 4+2 split is adopted as a working geometric assumption for disciplined operator construction. It is not a foundational postulate, and its validity rests on the emergent kinematics of the operator defined in Section 4.

Base Discrete Geometry and the $\mathcal{W}$-Hilbert Space

To construct the candidate operator $D^{(0)}_{\mathcal{W}}$, we must first define the Hilbert space upon which it acts. As established in v3, the smooth manifold is a low-resolution projection; the fundamental substrate of the $\mathcal{W}$-arena is discrete. We return to the Planck-scale expander graph $G_1 = (V, E)$, a Ramanujan-class graph whose vertices V represent discrete quantum informational states and whose edges E encode fundamental adjacency (entanglement/transition boundaries).

We define the total state space by taking the tensor product of the discrete spatial-informational geometry with the internal fiber.

Definition 3.1 ($\mathcal{W}$-Hilbert Space $\mathcal{H}_{\mathcal{W}}$)**.** The $\mathcal{W}$-Hilbert space is the composite space:

$$\mathcal{H}_{\mathcal{W}} := \ell^2(V(G_1)) \otimes \mathcal{H}_F, \tag{1}$$

where $\ell^2(V(G_1))$ is the space of square-summable complex functions on the vertices of the base graph G_1, and $\mathcal{H}_F$ is a chosen auxiliary internal Hilbert space associated with the fiber $\mathcal{F}_{\phi,A}$; in the minimal construction of this edition, $\mathcal{H}_F$ is taken to be finite-dimensional.

This bipartite structure ensures that any state in the $\mathcal{W}$-arena possesses both an informational location in the base graph and an internal dynamical state in the fiber.

Definition 3.2 ($\mathcal{W}$-Spinor)**.** A $\mathcal{W}$-spinor is a general element $|\Psi\rangle \in \mathcal{H}_{\mathcal{W}}$:

$$|\Psi\rangle = \sum_{v\in V} |v\rangle \otimes |\chi_v\rangle_F \,, \qquad \sum_{v\in V} \| \, |\chi_v\rangle_F \, \|^2 < \infty, \tag{2}$$

where $|\chi_v\rangle_F \in \mathcal{H}_F$ is the internal fiber state at vertex v, allowed to vary freely across $V(G_1)$. Product-state spinors, in which $|\chi_v\rangle_F = \psi(v)\,|\chi\rangle_F$ for a fixed normalised fiber state $|\chi\rangle_F$ and scalar amplitude $\psi(v)$, are a special case.

Remark 3.3 (Observer-Independence of $\mathcal{H}_{\mathcal{W}}$). Within the present candidate construction, $\mathcal{H}_{\mathcal{W}}$ is taken as the observer-independent state space on which chart-dependent coarse-graining acts. The observer-filter map $\mathcal{O}_T$ (formalized in Section 5) projects $\mathcal{H}_{\mathcal{W}}$ onto the accessible subspace above the thermal floor $k_B T/\hbar$. The biological observer chart U_{bio} interacts only with this projected subspace, not with $\mathcal{H}_{\mathcal{W}}$ directly. Whether $\mathcal{H}_{\mathcal{W}}$ is truly observer-independent at a foundational level is an open question deferred to the construction of $D_{\mathcal{W}}$ in Section 4.

The Candidate Bare Operator $D^{(0)}_{\mathcal{W}}$

To satisfy the boundary conditions established in v9 without imposing unearned algebraic assumptions, we construct $D^{(0)}_{\mathcal{W}}$ from the bottom up. We do not assume a κ-deformed Clifford algebra as a starting postulate; rather, we build the minimal candidate operator on the 4+2 fibered space and leave its emergent compositional kinematics as a testable consequence.

Definition 4.1 (Candidate Bare Operator $D^{(0)}_{\mathcal{W}}$)**.** The candidate bare Dirac operator on the $\mathcal{W}$-atlas is defined by the split-form tensor sum:

$$D^{(0)}_{\mathcal{W}} := D_{\text{base}} \otimes I_F + \gamma_5 \otimes D_{\text{fiber}}, \tag{3}$$

where I_F denotes the identity operator on the fiber space $\mathcal{H}_F$, and:

- D_{base} is a discrete graph Dirac operator acting on $\ell^2(V(G_1))$, encoding the extensive (S, I, E, C) geometric relationships of the base manifold $\mathcal{W}_{\text{base}}$.
- D_{fiber} is a finite-dimensional internal operator acting on $\mathcal{H}_F$, encoding the dynamical (ϕ, A) interactions of the fiber $\mathcal{F}_{\phi,A}$.
- γ_5 is the grading/chirality operator used to couple the base and fiber sectors.

Epistemic label: Candidate Operator / Ansatz. This object is not a derivation from a fundamental theory of quantum gravity; it is the minimal candidate operator proposed to support the chart-dependent transition maps of the $\mathcal{W}$-atlas.

Remark 4.2 (On the Emergence of κ-Deformation). Prior editions established that chart-level observables compose via the H-function κ-addition law. If $D^{(0)}_{\mathcal{W}}$ is the correct operator for the $\mathcal{W}$-arena, this κ-deformation must emerge naturally from its eigenvalue spacing under the thermal filter Π_T. We do not hard-code $\{\Gamma^a, \Gamma^b\} = 2g^{ab}_{\mathcal{W}(\kappa)}$ into the foundation; proving its emergence from $D^{(0)}_{\mathcal{W}}$ under coarse-graining is the critical consistency test of the programme (Open Problem O31).

The Spectral Filter Π_T and the Observer Map

The operator $D^{(0)}_{\mathcal{W}}$ acts on the candidate state space $\mathcal{H}_{\mathcal{W}}$, but physical observers do not access that space directly. As established in v9, an observer's thermal baseline acts as a

Jaynes-level chart-selection principle. We now formalize the observer-filter map $\mathcal{O}_T$ as a spectral projection onto an accessible sector of the spectrum of $D_{\mathcal{W}}^{(0)}$.

Ansatz 5.1 (Thermal Spectral Threshold)**.** The observer-filter map is executed by the spectral projection operator $\Pi_T \colon \mathcal{H}_{\mathcal{W}} \to \mathcal{H}_{\mathcal{W}}^{(T)}$. The projector retains only the eigenspaces of $D_{\mathcal{W}}^{(0)}$ whose spectral values λ satisfy

$$|\lambda| \geq \frac{k_{\mathrm{B}} T}{\hbar}. \tag{4}$$

Eigenvectors associated with spectral values below this threshold are projected out of the effective observer description, rendering those fine-grained structural details inaccessible to an observer at temperature T. This threshold is a working ansatz for the coarse-graining of the transition maps; any viable realisation of $D_{\mathcal{W}}^{(0)}$ must ultimately justify or refine it in a way consistent with v1–v9.

This spectral formulation provides the first formal handle on the vertical transformation introduced in Section 1. While horizontal transition maps τ_{ij} move an observer between spatial domains across the base graph, the vertical transformation acts in place at fixed support by changing the spectral projection:

$$\Theta_{T_1 \to T_2}(x) \colon \mathcal{M}_{T_1}(x) \longrightarrow \mathcal{M}_{T_2}(x). \tag{5}$$

Here $\Theta_{T_1 \to T_2}(x)$ denotes the induced comparison between the effective reconstructions $\mathcal{M}_{T_1}(x)$ and $\mathcal{M}_{T_2}(x)$ generated by shifting the spectral cutoff from T_1 to T_2. The formal construction of this comparison map is deferred to Open Problem O33.

Hypothesis 5.2 (T-Dependent Continuity). Because the spectral density of $\mathcal{H}_{\mathcal{W}}^{(T)}$ decreases as T increases, continuity is not treated here as a global property of the substrate. A mapping that appears smooth and continuous for a low-T observer may become singular, discontinuous, or undefined for a high-T observer examining the same underlying spectral support. In this sense, continuity is taken as chart-dependent rather than absolute.

The Spectral Arrow of Time

The relation between coarse-graining and irreversibility has been a recurring theme throughout the Manifold Relativity programme. Earlier versions argued that the observer does not access the underlying structure directly, but only through a chart-conditioned reconstruction. The construction developed in the present paper sharpens that idea: if physical access is mediated by the spectral filter Π_T, then any effective irreversibility seen by an observer may depend not only on the event itself, but on the observer's spectral truncation of that event.

This motivates, but does not yet prove, a spectral interpretation of the arrow of time. The basic intuition is straightforward. An observer whose thermal baseline projects out a substantial portion of the fine spectral structure of $D_{\mathcal{W}}^{(0)}$ will, in general, not retain enough information to reverse the effective reconstruction uniquely. By contrast, an observer with access to a denser spectral sector should recover a more nearly information-preserving description. The resulting distinction between apparently irreversible and nearly reversible evolution would then arise from chart-dependent access, rather than from a single globally imposed temporal asymmetry.

Conjecture 6.1 (Spectral Arrow of Time). Irreversibility is not a globally primitive property of the $\mathcal{W}$-arena, but an emergent artifact of the spectral truncation induced by the observer-filter Π_T. In this picture, higher-temperature observers, whose accessible sector is more strongly coarse-grained, reconstruct a more lossy and effectively irreversible dynamics, whereas lower-temperature observers, with access to a denser spectral sector, reconstruct a dynamics that is correspondingly closer to reversible.

We emphasise the epistemic status of this claim. Conjecture 6.1 is not a resolution of the arrow-of-time problem. It does not derive macroscopic thermodynamic irreversibility, nor does it establish a complete bridge between the spectral truncation of $D_{\mathcal{W}}^{(0)}$ and the observed temporal asymmetries of statistical mechanics or quantum measurement. What it provides is a precise structural hypothesis: if the observer map is fundamentally spectral, then temporal asymmetry may itself be chart-dependent.

The conjecture is therefore valuable in two ways. First, it gives a concrete target for future derivation: one may ask whether irreversible effective evolution can be obtained from repeated or temperature-dependent spectral truncation of the candidate operator. Second, it establishes a controlled boundary between what the current paper constructs and what remains open. The present work proposes a candidate operator and a candidate observer filter. Whether these ingredients are sufficient to generate the observed arrow of time remains an open problem.

Open Problems and Next Steps

The four open problems below constitute the primary research programme that v10 opens. O31 is the critical internal consistency gate: until it is resolved, the candidate operator cannot be promoted to an established result. O32–O34 are secondary but necessary for the programme's coherence.

Open Problem 7.1 (O31 — H-Function Composition from Spectrum). Show that the H-function κ-addition law

$$X_{A\oplus B} = H^{-1}\big(H(X_A) + H(X_B) - \tfrac{1}{\kappa}H(X_A)H(X_B)\big) \tag{6}$$

emerges as the effective chart-level composition law when the candidate operator $D^{(0)}_{\mathcal{W}}$ is projected by Π_T onto the accessible eigenvalue sector of an observer at temperature T. This is the primary internal consistency test for $D^{(0)}_{\mathcal{W}}$: failure would require revision of the operator or the threshold ansatz.

Open Problem 7.2 (O32 — Eigenspectrum of the Internal Fiber). Determine the eigenvalue structure of D_{fiber} acting on $\mathcal{H}_F$. Specifically: (i) identify whether the ϕ-sector generates a $U(1)$ gauge structure consistent with the periodic boundary conditions on phase; (ii) determine whether the A-sector generates a spectrum with the conjugate-momentum properties implicit in the action coordinate's role in v5–v9; (iii) verify that the combined fiber spectrum is compatible with the 4+2 Working Geometric Assumption 2.1.

Open Problem 7.3 (O33 — Formal Construction of the Vertical Transformation). Provide a rigorous construction of the vertical comparison map $\Theta_{T_1\to T_2}(x)\colon \mathcal{M}_{T_1}(x) \to \mathcal{M}_{T_2}(x)$ introduced in Section 5. Determine whether this map admits an operator representation on $\mathcal{H}_{\mathcal{W}}$, or whether it is irreducibly a relation between effective descriptions. Extend the cocycle condition of Open Problem O30 (v8) to include vertical composition: verify that $\tau_{\text{bio},BH} = \tau_{P,BH} \circ \tau_{\text{bio},P}$ remains consistent under composition with $\Theta_{T_1\to T_2}$ at fixed support.

Open Problem 7.4 (O34 — Chart-Dependent Reconstruction: Experimental Bound). Quantify the minimum temperature differential ΔT between two co-located detector systems required for the vertical transformation residual to exceed standard thermal calibration noise in a high-energy collision event. Determine whether this bound is experimentally accessible at operating temperatures achievable in current or near-future collider instrumentation, and specify the event-reconstruction variables (timing spread, channel fragmentation, inferred resonance lifetime) in which a chart-dependent residual would first appear.

Conclusion

Preprint v10 marks a structural inflection point for the Manifold Relativity programme. This edition does not claim to have resolved the deep questions it raises. It claims to have raised them precisely.

The single global chart of v1–v7, adequate for the biological observer's regime, was replaced in v8 by the W-atlas: a formal collection of observer-dependent charts connected by information-theoretic coarse-graining maps. The atlas raised an immediate question that v8 could not answer: what is the operator whose spectrum the charts are partitioning? Without $D_{\mathcal{W}}$, the chart structure remained structurally motivated but spectrally unfounded.

This edition takes the first step toward that operator. The 4+2 fibered split (Working

Geometric Assumption 2.1) resolves the signature ambiguity that would have compromised any flat 6D construction: phase and action are placed in an internal symplectic fiber rather than forced into Lorentzian signs they cannot honestly bear. The $\mathcal{W}$-Hilbert space $\mathcal{H}_{\mathcal{W}}$ is defined on the Planck-scale expander graph G_1 established in v3, giving the operator a discrete substrate consistent with the programme's foundational commitment to Planck-scale discreteness (inherited from v3 and v6; not freshly derived here). The candidate bare operator $D_{\mathcal{W}}^{(0)}$ is constructed in the minimal split-form consistent with this architecture.

The spectral filter Π_T formalises the observer-filter map $\mathcal{O}_T$ of v9 as a projection onto the eigenvalue sector accessible at thermal baseline T. It converts the conceptual observer-dependence of the atlas into a calculable operation on $\mathcal{H}_{\mathcal{W}}$, conditional on $D_{\mathcal{W}}^{(0)}$ being correctly specified. The Spectral Arrow of Time (Conjecture 6.1) is the most ambitious claim of this edition: it is offered as a structural hypothesis, not a derivation, proposing that temporal asymmetry may itself be chart-dependent.

The immediate future of the programme hinges on Open Problem O31. The candidate operator $D_{\mathcal{W}}^{(0)}$ must be subjected to rigorous spectral analysis to verify whether the H-function κ-addition algebra of v7 genuinely emerges from its truncated eigenvalue spacing. Until that derivation is secured, $D_{\mathcal{W}}^{(0)}$ remains exactly what it is labelled: a mathematically motivated candidate for the engine of the self-referential universe.

Version Changelog

v10.0 (2026): Introduces the candidate Dirac operator $D_{\mathcal{W}}^{(0)}$ on the $\mathcal{W}$-atlas. Primary contributions: 4+2 fibered geometric split (Working Geometric Assumption 2.1); definition of the $\mathcal{W}$-Hilbert space $\mathcal{H}_{\mathcal{W}}$ and $\mathcal{W}$-spinors; candidate bare operator $D_{\mathcal{W}}^{(0)} = D_{\text{base}} \otimes 1 + \gamma_5 \otimes D_{\text{fiber}}$; spectral filter Π_T formalizing the observer-filter map $\mathcal{O}_T$; T-dependent continuity hypothesis; Spectral Arrow of Time (Conjecture 6.1). Four new open problems (O31–O34). All principal constructions are explicitly labeled Candidate Operator or Ansatz; no claims are promoted to established results without derivation.

v9.0 (2026): Introduced the chart-local speed of time $\Upsilon = dS/d\tau|_{U_T}$, the invariant bound $\Upsilon_{\max} = c_S$, and Prediction P.v9.1 (Differential Proper-Time Accumulation).

v8.1 (2026): Corrected two v8.0 overclaims identified by the ChatGPT referee: thermodynamic relativity bridge restored to Bridge Conjecture BC1 status; self-referential atlas language corrected.

v8.0 (2026): Introduced the W-atlas $\mathcal{A}_{\mathcal{W}}$, three-layer ontology, three principal charts, atlas self-consistency condition, Fisher distance between charts.

(v1.0–v7.0: see [1].)

References

[1] Sorvik, P. E. (2026). *Entropy Waves, Coordinate Systems, and the Self-Referential Universe* (v1.0–v9.0). paulsorvik.wordpress.com.

[2] Livadiotis, G., & McComas, D. J. (2024). The theory of thermodynamic relativity. *Scientific Reports*, **14**, 22641. doi:10.1038/s41598-024-72779-0

[3] Reingold, O., Vadhan, S., & Wigderson, A. (2002). Entropy waves, the zig-zag graph product, and new constant-degree expanders. *Annals of Mathematics*, **155**, 157–187.

[4] Connes, A. (1994). *Noncommutative Geometry.* Academic Press.

[5] Wigner, E. P., & Yanase, M. M. (1963). Information contents of distributions. *PNAS*, **49**, 910–918.

[6] Parker, D. E. et al. (2019). A universal operator growth hypothesis. *Physical Review X*, **9**, 041017.

[7] Bekenstein, J. D. (1973). Black holes and entropy. *Physical Review D*, **7**, 2333–2346.

[8] Planck Collaboration (2018). Planck 2018 results VI. *Astronomy & Astrophysics*, **641**, A6.

[9] McConnell, N. J., & Ma, C.-P. (2013). *The Astrophysical Journal*, **764**, 184.

Preprint v10.0. Candidate Dirac Operator on the $\mathcal{W}$-Atlas. All principal constructions are labeled Candidate Operator or Ansatz.

Available: paulsorvik.wordpress.com