Space Immanence — Academic Edition

A Formal Précis

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A compact, cited statement of the proposal and its relation to existing work. By Cobus Kok.

Abstract

This edition states the Space Immanence proposal in formal terms and situates it within current philosophy of mind, philosophy of physics, and cognitive science. The proposal diagnoses two long-standing problems, the hard problem of consciousness and the emergence of spacetime from a non-spatiotemporal substrate, as inheriting a shared assumption: that to exist is to be a content located inside a container. It offers a structural alternative, the *fold*, defined as a configuration in which a subset of relations takes other relations, including its own operation, as content. A fold meeting four criteria is argued to have exactly two primitive orientations, outward (appearing as world) and inward (appearing as awareness); the argument is conceptual rather than formal, and its status is treated as an open problem in Section 3. The diagnosis is also stated as a candidate solution to the meta-problem of consciousness (Section 2.1). The proposal is dissolutionist rather than solutionist about the hard problem, and interpretive rather than contributory about physics. Its central claims are graded by confidence; its residual gaps and disconfirmation conditions are stated explicitly. This document is the formal companion to the discursive working paper.

Keywords self-reference; consciousness; spacetime; neutral and dual-aspect monism; structural realism; predictive processing; contemplative phenomenology

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1. Précis of the proposal

Two problems resist their standard framings. The hard problem of consciousness (Nagel 1974; Chalmers 1995) asks how physical process gives rise to subjective experience. The spacetime-emergence problem asks how spacetime arises from a substrate that is not itself spatiotemporal. The proposal's first claim is that both inherit a single assumption, here called *container-logic*: that the basic way to exist is to be a content located in a pre-given frame, whether the frame is space, time, or a subject.

Container-logic distorts each problem in the same way. For consciousness, it forces the question into the form "where, in the physical container, is experience produced?" For spacetime, it forces "what does spacetime emerge *into*?", smuggling a prior container back into an account meant to dispense with one

(Baron 2020). The proposal's diagnostic move is to treat the difficulty as an artefact of the framing rather than a brute fact to be bridged.

A caution belongs with the consciousness half of that diagnosis, because the canonical statements of the hard problem are deducibility arguments, not location questions. The conversion from production to containment must be argued, not assumed: the argument, given in full in Part I of the working paper, is that deducibility needs a direction, that the direction pictures experience as a further item the physical base must supply, and that a zombie world is a container with the experience subtracted and the structure left whole, an operation that is coherent only if experience is a content separable from its container. The strong reading of the diagnosis rests on that step; the weak reading (the container schema is load-bearing in the cognition that generates problem intuitions) is independently testable and is priced separately in the claims ledger.

The constructive proposal replaces emergence with *perspective*. On a relational substrate, where relations rather than locations are basic (Rovelli 1996; Ladyman and Ross 2007), spacetime is not what the substrate produces but how the substrate is disclosed to a region of itself that models a world it belongs to. The same move applies to consciousness: experience is not what matter produces at sufficient complexity but how a sufficiently recursive structure is disclosed from within.

That recursive structure is the *fold*: a configuration in which a subset of relations takes other relations, including its own operation, as content. To exclude trivial recursion (a thermostat, a self-referential spreadsheet), a consciousness-relevant fold must meet four criteria: integrated self-modelling, temporal continuity, counterfactual sensitivity, and self-maintaining operational integrity. A fold meeting these criteria is argued to have exactly two primitive orientations, toward represented content and toward representational activity; the argument is conceptual rather than formal, and Section 3 states what a demonstration would require. The first orientation appears as world; the second appears as awareness. They are two appearances of one structure, not two substances.

The proposal grades its confidence. The *diagnosis* (container-logic distorts both problems; several fields are under convergent pressure away from it) is offered as strong. The *bridge* (the fold as the structural link between world-appearance and awareness; predictive processing as its biological implementation) is offered as medium. The two *identifications* (spacetime as the fold seen from within; the fold's inward orientation as the phenomenal inside) are offered as speculative. The graded list and an interactive dependency map are given in the working paper and the claim map. Version 1.5 adds a dynamic layer, *cohering* (temporary conditioned coherence-events; the term was renamed from "resolution" in v2.0 when its published probation clause fired under reader criticism): the medium tier gains the claim that self and world are conditioned coherence-events rather than fixed entities, and the two speculative identifications are re-read in process form, spacetime and inside-ness as how the fold coheres rather than what it statically is. The fuller treatment is the dynamic-layer note.

2. Relation to existing work

The proposal is a synthesis, and it is more credible for saying plainly what it borrows and where it departs. This section places it against its nearest neighbours.

2.1 Philosophy of mind

The hard problem. The proposal accepts the explanandum named by Nagel (1974) and Chalmers (1995, 1996): there is something it is like to be a conscious system, and no functional story has explained why. It rejects the assumption that this requires a bridge from a physical container to a separate phenomenal one. In this it is dissolutionist rather than solutionist, but it differs from **illusionism** (Dennett 1991; Frankish 2016), which dissolves the problem by denying that phenomenal consciousness is what it seems. The proposal does not deny phenomenal consciousness. It relocates it as the fold's being-from-within, and it argues that the demand for a further bridge may itself be the container-logic it is trying to leave behind. This relocation is a conjecture, not a proof; the residual difficulty is named in Section 3.

The meta-problem. The diagnosis has a natural statement in the vocabulary of Chalmers' (2018) meta-problem of consciousness: the problem of explaining why we judge that consciousness poses a hard problem. In those terms, the proposal's first claim is a candidate solution: problem intuitions arise from a misapplied container schema, a schema whose grip on ordinary cognition is independently documented in cognitive linguistics (Lakoff and Johnson 1980; Johnson 1987; Kövecses 2000). This placement makes the diagnosis empirically exposed in a way a purely philosophical dissolution is not. It predicts a specific dissociation: intuitions about the location and production of consciousness should be manipulable, for example weakening with contemplative practice depth, while intuitions about the reality of experiencing hold steady. Illusionism, which answers the meta-problem by treating the phenomenality intuition itself as the artefact, predicts the two weaken together. The research agenda states the corresponding study design; objection 12 in the dossier states the confrontation directly. Early empirical work on problem intuitions exists and supplies instruments (Fischer and Sytsma 2021), though not yet in contemplative populations.

Neutral monism, dual-aspect monism, and Russellian monism. The closest neighbours form a family that posits one reality more basic than the mental–physical division, but they differ, and the proposal should be placed precisely. Neutral monism (James; Russell 1927) holds that the base is intrinsically neither mental nor physical. Dual-aspect monism holds that one substance carries two inherent aspects. Russellian monism in its panpsychist form (Strawson 2006) holds that the intrinsic nature of the physical is already phenomenal. The proposal sits closest to neutral monism: the substrate is not conscious, and awareness appears only where there is a fold, so it is explicitly not panpsychist and does not place experience at the base. Its distinctive contribution is to identify the two appearances with the two *orientations of self-reference*, and to give a structural reason why there are exactly two rather than leaving the number unexplained: recursion minimally requires represented content and representing activity, and no more. Whether that "and no more" can be made a theorem rather than a conceptual argument is taken up in Section 3. It also ties the neutral base to the relational substrate that physics independently points toward, rather than leaving its intrinsic nature unspecified.

Reflexive monism. The nearest neighbour by name is Velmans' (2009) reflexive monism, on which the world as experienced and the awareness of it are reflexively related aspects of one process, the perceived

world and the percipient forming a single reflexive whole. The resemblance is real and should be stated before the difference. The difference is cleanest on the side reflexive monism does not address at all: it is a philosophy of mind, a claim about how an experiencing subject and its perceived world stand to one another, and it says nothing about the emergence of spacetime, whereas the present proposal applies the same reflexive figure to the physics side and reads the spacetime case as the same structure seen from the other orientation. Two further departures follow. Velmans begins from an already-experiencing subject, while the fold is offered as ontologically prior to subjects and does not place experience at the base; and reflexive monism does not derive its two aspects from anything, while the proposal ties them to the two orientations of recursion and to the relational substrate physics independently points toward. A reader who reaches for "this is just reflexive monism" has the spirit right and the scope wrong. Merleau-Ponty's (1968) chiasm, the reversibility of the seer and the seen, is a phenomenological ancestor of the same figure, located in the lived body rather than in recursion as such.

Self-model theory. The fold overlaps substantially with Metzinger's (2003) self-model theory, and the four fold-criteria are close in spirit to his constraints on phenomenal selfhood. The departure is metaphysical: Metzinger is a representationalist for whom no self exists, the self-model being a transparent fiction, whereas the proposal treats the fold as a structural reality whose inward orientation is awareness. The proposal also extends the structure beyond the brain to the spacetime side, which self-model theory does not attempt.

Higher-order theories. The fold's inward orientation, attention toward representational activity, is structurally close to higher-order theories of consciousness, on which a state is conscious when it is itself represented by a higher-order thought (Rosenthal 2005) or perception (Lycan 1996). The decisive difference is location. Higher-order theories are claims about brain-bound representational hierarchies within the container; the fold is offered as ontologically prior to the container and as applying equally to the spacetime side. Read uncharitably, the fold is a metaphysically inflated higher-order theory; the proposal's reply is that higher-order theories presuppose the very inside/outside geometry it is trying to get behind, and that the two orientations are primitive features of recursion rather than one representational level trained on another.

Strange loops. The proposal can be read as a metaphysical generalisation of Hofstadter's (1979, 2007) account of the self as a strange loop, carried from selfhood to spacetime and made ontologically primitive rather than brain-bound. The recursion-is-self intuition is inherited; the claim that the loop is prior to space is the departure.

Integration and enaction. The integration criterion echoes integrated information theory (Tononi 2008), though the proposal offers no scalar measure and is a reframing rather than a measurement theory. The rejection of the spectator-in-a-container model, and the treatment of cognition as enacted rather than received, are shared with the enactive tradition (Varela, Thompson, and Rosch 1991; Thompson 2007), to which the two-orientation phenomenology is congenial.

2.2 Philosophy of physics

The proposal borrows a direction and contributes no physics. The direction is the now-substantial body of foundational work treating spacetime as non-fundamental: relational quantum mechanics (Rovelli 1996), entropic and emergent gravity (Verlinde 2011), the information-theoretic tradition descending from Wheeler (1990), and the program deriving geometry from entanglement (Van Raamsdonk 2010; Maldacena and Susskind 2013). Two cautions belong with that last pair: ER=EPR is a conjecture rather than an established result, and the entanglement-to-geometry results are specific to anti-de Sitter (holographic) settings and do not transfer straightforwardly to a realistic cosmology. The proposal leans on the direction these programs indicate, not on any one of them as a finished result. Ontic structural realism (Ladyman and Ross 2007) supplies the "relations before relata" backbone, and Baron (2020), with related work by Huggett, Wüthrich, and Le Bihan, supplies the specific argument that the ordinary metaphysics of emergence struggles with spacetime.

The container genealogy, sourced. The historical distinction the diagnosis leans on has canonical owners. Einstein himself, in his foreword to Jammer's *Concepts of Space*, distinguishes space as "the positional quality of the world of material objects" from space as "a container of all material objects" — the container concept named as one contingent option, by the physicist whose theory weakened it (Jammer 1954/1993). Earman (1989) carries the modern absolute-versus-relational debate, and the Leibniz–Clarke correspondence (1717) is its founding text: Leibniz's "order of the coexistence of objects" is the positional reading three centuries early. Traxler (2017) deserves specific credit for re-carving this history as *transcendent versus immanent* conceptions of space — an ambient super-structure prior to objects, versus space created relationally through them — which is the same cut this proposal draws, under the same word this site is named with; the vocabulary convergence is coincidence, disclosed here because half the claims are genuinely shared. Two of her points push against the proposal rather than for it, and they are recorded rather than smoothed: she classes quantum-mechanical practice — Hilbert-space formalism and the experimenter's bench — as still transcendent, which independently supports Section 4's judgment that the physics arm carries the least weight; and her conclusion is a Bohr-styled *complementarity* of container and non-container conceptions, not the container's retirement — a moderating position this proposal's harder reading has to answer, not adopt.

The measurement problem as a second point of contact. There is a more direct place where self-reference does formal work in physics than the non-fundamentality of spacetime: the measurement problem, which is at bottom a problem about a system that has to be described by a description that includes the describer. The Wigner's-friend literature, and in sharp form the Frauchiger and Renner (2018) theorem and Brukner's (2018) no-go result, show that letting observers model observers who model them produces genuine inconsistency rather than metaphor, self-reference yielding a hard result in physics now. Two honesties have to travel with this, or it becomes the very kind of false convergence the proposal warns against elsewhere. First, the self-reference in these results is epistemic, a matter of agents' inferences about agents going inconsistent, whereas the fold's self-reference is ontological; that the two rhyme is suggestive, but whether they are the same structure is a bridge that would have to be built, not a juxtaposition to be leaned on. Second, relational quantum mechanics (Rovelli 1996) is the natural meeting point, since its facts are observer-relative all the way down, but it is deflationary about the wavefunction and resists the ontological reading the fold would put on it, so it is a candidate interlocutor rather than a

friendly witness. With those cautions stated, the measurement problem gives the physics arm a contact with self-reference more specific than the observation that classical spacetime is not fundamental, without pretending the identification has been earned.

The honest statement of the relationship is in Section 4: the link the proposal draws between the physics sense of “non-fundamental spacetime” and the consciousness sense of “self-reference” is a structural conjecture, not a physical result, and it is the proposal’s weakest claim.

2.3 Cognitive science

Predictive processing (Friston 2010; Clark 2013, 2016; Hohwy 2013; Seth 2021) is used as a candidate implementation of the fold in biological brains: the self as a predictive process rather than a thing that has predictions, the body as part of the model, perception as active construction. The proposal adds nothing empirically to predictive processing. It offers a structural interpretation of why self-model dynamics might exhibit a two-orientation character, and it treats experimental manipulations of the self-model (meditation, pharmacology, psychiatric conditions) as probes of the fold’s transparency to itself.

2.4 Process philosophy and the critical tradition

The rejection of “simple location” and the priority of process and relation over enduring substance are Whiteheadian (Whitehead 1929), and the proposal is in part a contemporary structural restatement of that rejection. The treatment of space and time as forms of a perspective rather than as container-things has a clear ancestor in Kant (1781), which the proposal radicalises by tying the forms to self-reference and extending them beyond the human subject. The cross-domain diagnosis itself also has its nearest prior owner in Kant: the transcendental dialectic treats the paralogisms (categories misapplied to the subject) and the antinomies (categories misapplied to the world-whole) as one faculty overreaching in two directions, one diagnosis with two symptoms. The proposal’s delta is to naturalise that move: the overreach is read as a contingent cognitive schema rather than reason’s fixed constitution, the noumenal container Kant retained in all but name is dropped, and the diagnosis becomes testable where critique could only be written.

2.5 Contemplative studies

The proposal reads cross-tradition contemplative reports as falling into two orientations and interprets this structurally, as the fold becoming transparent to itself. This places it inside an existing and unresolved debate in the study of mysticism, between constructivists who hold that experience is shaped through and through by tradition and language (Katz 1978) and those who argue for a tradition-independent core (Forman 1990). The honest status of the claim is an *interpretive pattern proposed for testing*, not a corpus result: the proposal cites no systematic corpus, and the two-orientation reading would need operationalised selection criteria and controls for the very confounds it names (translation effects, teacher expectation, cross-cultural transmission, shared neurobiology) before it could count as data. Its distinctive move is the structural interpretation; its standing risk is over-flattening traditions, which it explicitly disavows, holding that Zen and Advaita differ doctrinally and are at most complementary completions of one polarity, and that a tradition such as Madhyamaka may refuse the structural posit altogether. The universal reading is

held as a hypothesis, not a result. For a contemporary model of how such first-person reports can be set beside neuroscience without either dissolving the other, see Thompson's *Waking, Dreaming, Being* (2014). One classical source bears unusually directly on the spacetime side rather than the consciousness side: Dōgen's "Uji" (Being-Time) in the *Shōbōgenzō* (c. 1240) treats being and time as inseparable rather than the one contained in the other, which is the temporal analogue of the proposal's rejection of the container, and which also presses the sharpest objection in return, that a recognition realised in practice may not be reducible to the structural description offered here.

2.6 What is new

Stated conservatively, three moves appear to be the proposal's own. First, the cross-domain diagnosis that the hard problem and spacetime emergence are the same shape, generated by one shared assumption, and can be addressed by one move. Second, the specific claim that recursion has exactly two primitive orientations and that these map onto world and awareness. Third, the symmetric application of "perspective, not emergence" to both problems at once. What is inherited is substantial and named above: relational ontology, non-fundamental spacetime, the recursive self, dual-aspect structure, and the critique of the container.

2.7 The terrain at a glance

The map below places the positions discussed above on two axes. The horizontal axis asks how strongly a position assumes *container-logic*, that to exist is to be a content inside a pre-given frame, versus treating relations as more basic than the container. The vertical axis is the familiar materialist–idealist spectrum. Space Immanence's claim about itself is legible as a position: as far toward the relational end as the map goes, and on the neutral midline, because it takes no side between materialist and idealist by construction. These placements are arguments, not measurements; the table states the same placements in words.

A conceptual map of the terrain. Positions are placed by argument, not measured; the axes are interpretive, not quantitative. The point is the relationships, not coordinates.

The same placements, stated in words.

Position	**Stance on the container**	**Materialist ↔ idealist**
Reductive physicalism	Assumes it: matter is the container	Materialist
Illusionism	Assumes it: the physical container is the whole story; the phenomenal appearance is a misrepresentation	Materialist
Substance dualism	Assumes it: two containers	Both, unreconciled
Idealism / Advaita Vedānta	Assumes it: awareness is the container	Idealist

Position	Stance on the container	Materialist ↔ idealist
Russellian panpsychism	Loosens it: phenomenal intrinsics at the base	Leans idealist
Neutral monism	Loosens it: a neutral base	Neutral
Reflexive monism	Loosens it: one process, reflexively two aspects	Neutral
Process philosophy	Rejects it: process before substance	Neutral
Ontic structural realism	Rejects it: relations before relata	Neutral
Space Immanence	Rejects it: relations before relata	Neutral, by construction

Illusionism is on this map deliberately: it is the live opponent, the position that gains strength as AI systems become fluent reporters of unverifiable states, and it is engaged directly in objection 12 and in the dissociation prediction of Section 2.1. The map is a triage aid, not a survey; positions not listed are not thereby dismissed.

3. Open problems and disconfirmation

The inside-ness gap. A fold has a topology. Whether the topology has a phenomenal inside, or only a structural one, is not established. The proposal's response is that the demand for a further bridge from structure to phenomenality may itself be container-logic, since "produce" presupposes a container in which the product appears. This response is a diagnostic, not a proof: if the proposal is right the objection partly dissolves with it, and if the proposal is wrong the objection stands. The proposal cannot establish itself by noting the objection's dependence on its opposite. This is the pivot of the argument, and it is not yet complete.

The universality gap. The two-orientation topology is robust in human contemplative phenomenology. Whether it is a universal feature of any fold or a human-specific cross-section of something richer is underdetermined by current evidence. The strong reading predicts that any sufficiently recursive fold converges on two orientations; the weak reading allows other topologies for non-human or artificial folds.

The status of "exactly two." That a fold has exactly two primitive orientations, and no more, is the structural spine of the proposal, and at present it is a conceptual argument rather than a theorem: recursion needs something represented and some activity representing it, and the proposal holds that nothing further is forced. The natural place to look for a proof is the mathematics of self-reference. Lawvere's (1969) fixed-point theorem gives the diagonal structure shared by Gödel, Cantor, Tarski, and Russell; Scott's (1976) reflexive domains, with their defining isomorphism between a domain and its own space of self-maps, give a rigorous form of "a structure isomorphic to its own operations"; and the eigenform tradition (Spencer-Brown 1969; von Foerster 2003; Kauffman 2005) studies stable forms as fixed points of

recursive operation. These are the right neighbourhood, but it is worth being exact about what they deliver. A fixed-point theorem yields the existence of a fixed point; reflexive domains yield reflexivity; eigenforms yield stability under recursion. None of them yields the count “exactly two, and no more,” which is what the proposal asserts, and the two legs of a diagonal are an analogy for the two orientations rather than a derivation of them. So the formal task is specific: to state “exactly two orientations” as a property of a reflexive object meeting the four fold-criteria, and to show that the property holds of that object and fails of its near neighbours. Until that is done the claim is held as characteristic of the fold rather than proven necessary to it, and is graded accordingly; importing the formalism without closing the gap would add the appearance of rigour rather than rigour itself, which is a trade the proposal declines.

The realization objection. A Russellian critic will press the complement of the inside-ness gap: relations need relata; a purely structural description with nothing said about its instantiation risks Newman’s collapse into near-triviality; and physics’ silence on intrinsic natures is an open slot rather than a category error, with experience as the one candidate filler we know from the inside (Russell 1927; Strawson 2006). Version 1.5 answered through the dynamic layer — the realizer role played by activity, relata as coherence-events, structure enacted rather than fleshed out. Version 2.0 withdraws that reply: independent readers showed it deployed the dynamic term as exactly the load-bearing metaphysical occupant the framework’s own guardrail forbids. The objection therefore stands open and unanswered at full strength; the proposal still pays the inside-ness gap where Russellian monism pays the combination problem, but it no longer claims the realizer slot is filled. Objection 13 in the dossier records the withdrawal.

Disconfirmation conditions. The proposal is weakened by: careful corpus work that finds no stable two-orientation clustering after controls; a robust mismatch between predictive-processing self-model dynamics and the fold account; a demonstration that the four fold-criteria are satisfied by systems no one is tempted to count as candidates; a successful, non-question-begging separation of structural self-reference from phenomenality that does not rely on container assumptions; a demonstration that the fold framing does no explanatory or dissolving work the container framing cannot already do; and accounts of non-fundamental spacetime in physics that assign no role to perspective. The research agenda develops these conditions in detail.

4. Status of the physics claim

The proposal makes no claim within physics and derives no physical result. The foundational programs cited in Section 2.2 are mathematically specific and do not mention self-reference or perspective. The proposal’s reading of them, that the direction away from a pre-given container is a move from emergence to perspective, is a philosophical interpretation of work physicists are pursuing on their own terms. The further claim, that the perspective in question is the same self-reference at work in consciousness, is a structural conjecture offered for criticism, not a bridge that has been built. Readers from physics should treat the physics-side material as interpretation, and the cross-domain identification as the proposal’s most exposed and most falsifiable commitment.

One consequence for the graded claims is worth stating. The “convergent pressure” the proposal lists among its strong claims is strongest for the contemplative and predictive-processing arms and weakest for the physics arm, where it amounts to little more than the uncontroversial observation that classical spacetime is not treated as fundamental by the programs above. Taken alone, the burden-shifting force of the physics arm should be read as medium at most. The measurement-problem contact noted in Section 2.2 makes the arm more interesting than that, but, since the identification of its self-reference with the fold’s is exactly what has not been built, it sharpens the arm without raising its evidential weight.

References

References are provided to place the proposal in its literature. They are canonical works for the positions discussed; the Timmermann preprint, being recent, should be confirmed against its published form before formal citation.

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