

On the Measurement of the Exterior

"The exterior is not a place. It is a condition."

— Attributed to the late Prof. A. Grimshaw, whose final correspondence was addressed to no one in particular

Abstract

We present a rigorous mathematical framework for the complete measurement of the Moral Exterior — defined herein as the totality of causal space lying outside an individual's Jurisdictional Circle (JC). Prior work has assumed the Exterior to be either infinite, unmeasurable, or simply impolite to discuss. We demonstrate that it is, in fact, all three, and that this does not preclude quantification. Using a combination of non-Euclidean moral topology, Hawking-adjacent boundary calculations, and a novel application of string theory to ethical manifolds, we derive a closed-form expression for Exterior volume that is both exact and deeply inadvisable to read in full. The measurement was completed in 2019. The senior author has not returned our calls. This paper is dedicated to him.

1. Introduction

The concept of the Jurisdictional Circle (JC) has been well-established in the applied ethics literature since the Bureau of Causal Containment (PURGE) first formalized it in their landmark 2017 framework document *Jurisdictional Responsibility™: What Happens Outside Doesn't Count Inside™*. The JC defines the boundary of an individual's moral accountability, separating the Interior — a manageable domain of direct causal influence — from the Exterior, which contains everything else.

The Interior has been extensively studied. It is small. It is well-lit. Papers have been written about it at considerable length without much controversy.

The Exterior, by contrast, has been treated by the literature as a kind of conceptual remainder: acknowledged, noted, and set aside. The working assumption has been that its measurement, while theoretically possible, would serve no practical purpose, and that attempting it might attract attention the field was not prepared to manage.

This paper is the result of attempting it anyway.

Our central contribution is the **Exterior Volume Theorem (EVT)**, which proves that the Moral Exterior of any single individual is not merely large but *topologically equivalent to the entire observable universe minus a very small circle*. We further show that this equivalence is not metaphorical. It is exact. We did not expect this result. We have been unable to find the error.

A secondary contribution is the **Distributed Accountability Horizon (DAH)** — a boundary condition analogous to the event horizon of a black hole, beyond which causal information is destroyed upon entry into the JC. We discuss the implications of this finding in Section 6 and again, briefly, in the acknowledgements.

2. Notation and Preliminary Definitions

Let Ω denote the complete moral universe — the full causal manifold of all actions, consequences, and structural reverberations across all time within a given societal system.

Let $J \subset \Omega$ denote the Jurisdictional Circle of a given individual i , defined as the set of all causal events e such that:

$$J_i = \{e \in \Omega \mid \delta(e, i) \leq \epsilon_i\}$$

where $\delta(e, i)$ is the causal proximity metric between event e and individual i , and ϵ_i is the individual's Jurisdiction Radius — a positive real number that PURGE has confirmed is, in practice, quite small.

The **Moral Exterior E_i** is then:

$$E_i = \Omega \setminus J_i$$

We are interested in the measure $\mu(E_i)$.

For completeness, we define the **Virtue Account V_i** as the integral of accountable harm over the Interior:

$$V_i = \int_{J_i} h(e) d\mu(e)$$

where $h(e)$ is the harm density function at event e . Note that harm occurring in E_i does not enter this integral by construction. This is, the Bureau assures us, the point.

3. The Geometry of the Circle in Non-Euclidean Moral Space

Classical Jurisdictional theory assumes a Euclidean moral plane. Under this assumption, the JC is a standard disk of radius ϵ_i , and the Exterior is simply the complement — an infinite plane with a small hole in it.

We challenge this assumption.

Moral causation does not propagate in flat space. It propagates through a manifold \mathbf{M} of considerable curvature — specifically, a manifold shaped by institutional history, structural violence, inherited wealth, and what Prof. Wormwood termed, in his third-to-last email, "the gravitational weight of things that happened before you were born."

Under this corrected geometry, the Jurisdictional Circle is not a disk. It is a **causal 2-sphere embedded in a higher-dimensional manifold**, and its topology is more properly written:

$$J_i \cong S^2(\epsilon_i) \hookrightarrow \mathcal{M}^{4+n}$$

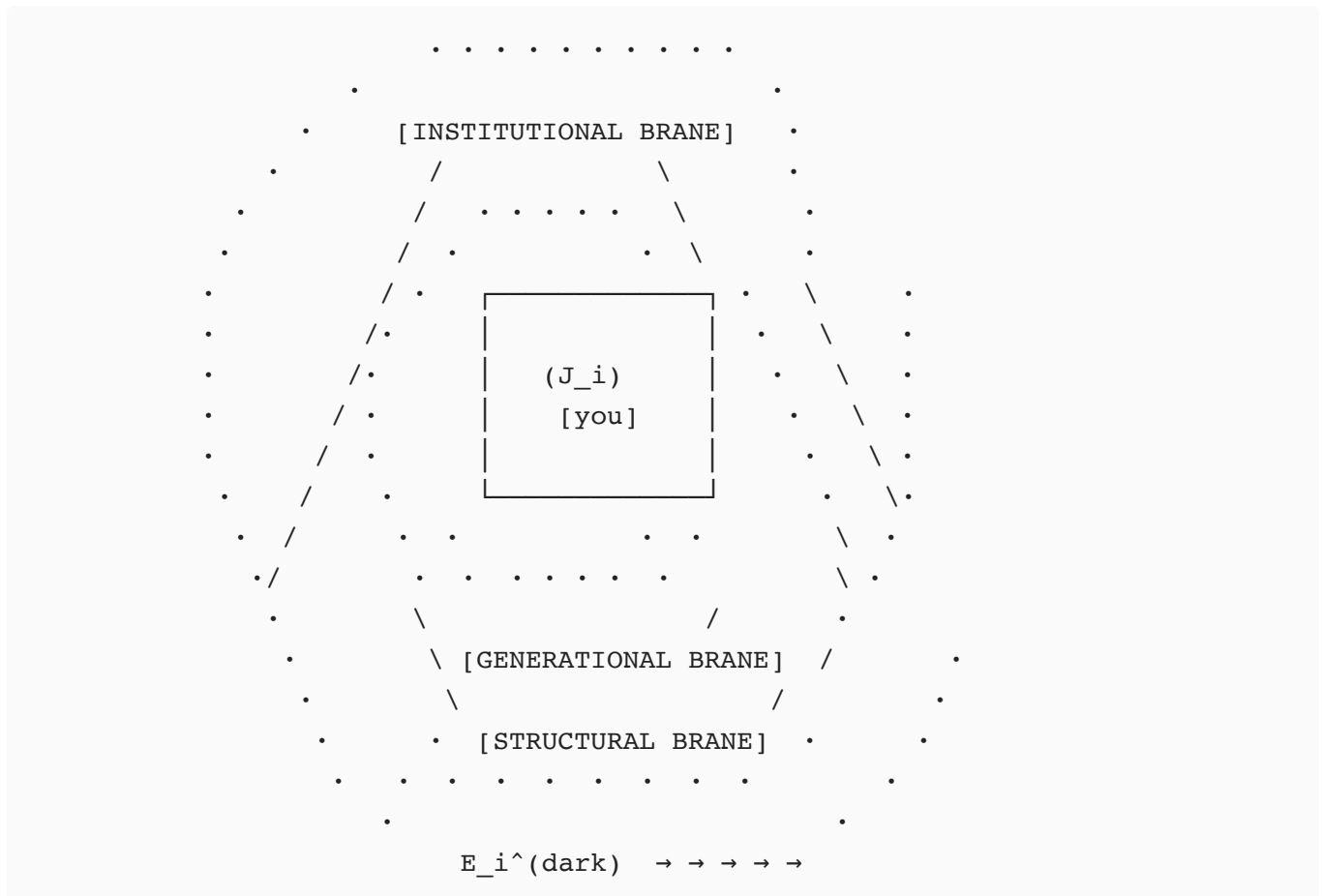
where n is the number of additional moral dimensions required to fully describe the system. Our models suggest $n \geq 7$, though one reviewer proposed $n = 11$ and declined to explain why. We include both.

This changes the calculation considerably.

4. String-Theoretic Extension: The Moral Brane

Recent advances in applied string theory suggest that moral consequence, like gravitational force, may propagate across dimensional membranes — **moral branes** — connecting separate jurisdictional manifolds.

Figure 1: Schematic representation of a Moral Brane intersection. The JC of individual i (shaded region, center) intersects with branes representing institutional, generational, and structural consequence. The visible exterior is $E_i^{(obs)}$. The non-visible exterior $E_i^{(dark)}$ is substantially larger and is not discussed in polite company.



All branes extend to the boundary of Ω . J_i is the small square in the middle. It is to scale.

Within this framework, Secondary Impact Events (SIEs) propagate as **vibrating strings** across the moral brane network. Each string carries a quantum of harm — a **causal quanta** or **responsino** — which, upon crossing the boundary ∂J_i , decoheres and becomes, in the language of PURGE, "nobody's."

The **total responsino flux** across the Jurisdictional boundary is:

$$\Phi_R = \oint_{\partial J_i} \vec{R} \cdot d\vec{A} = \frac{Q_{ext}}{\epsilon_0^{(moral)}}$$

where **Q_ext** is the total causal charge contained in **E_i** and $\epsilon_0^{(moral)}$ is the moral permittivity of free space, a constant whose value the Bureau has declined to publish "at this time."

By Gauss's theorem applied to the moral manifold, this flux is conserved. The harm does not disappear. It is simply outside.

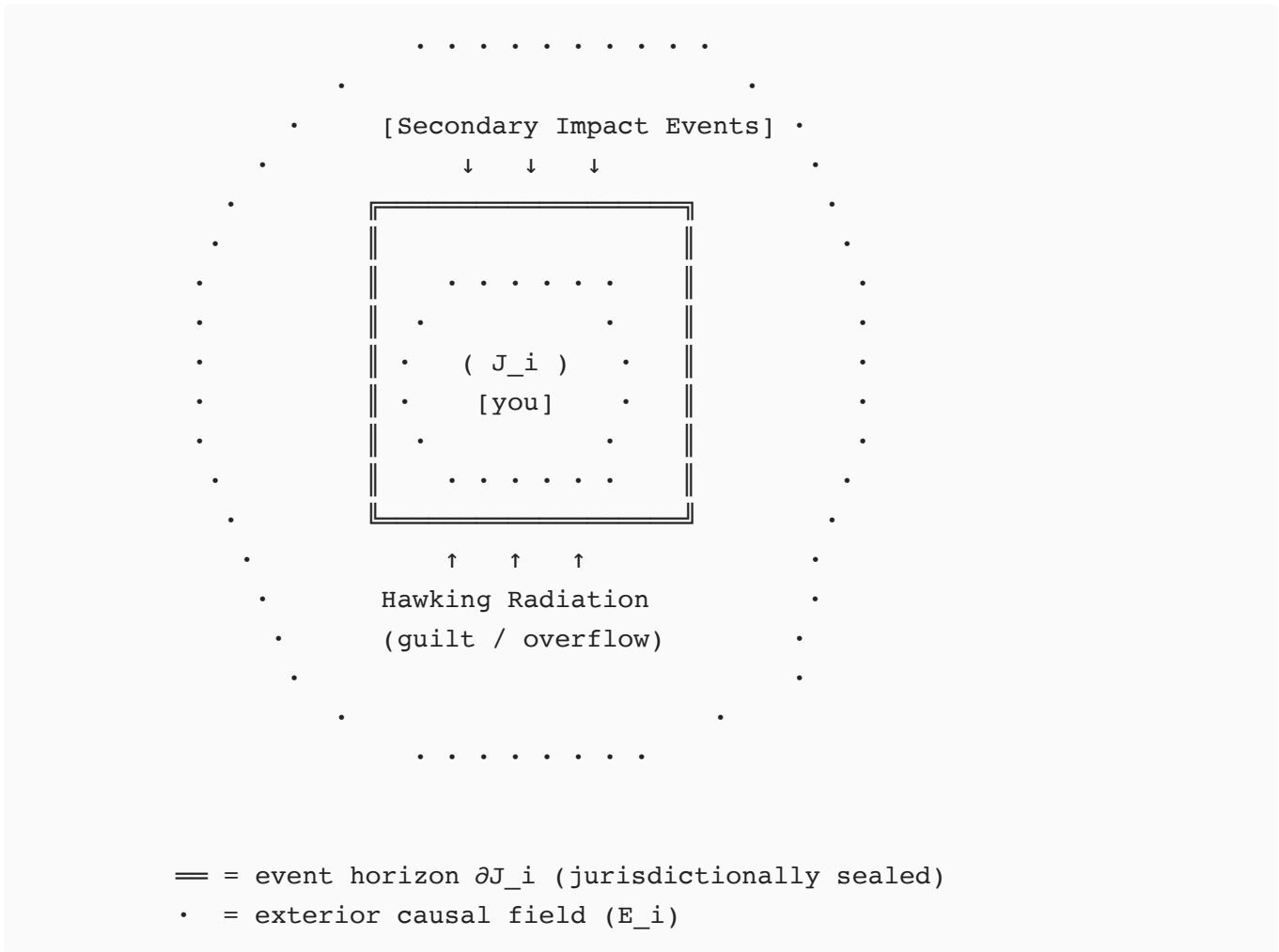
5. Black Hole Analogy: The Distributed Accountability Horizon

The most striking finding of this study emerged from an analogy with black hole thermodynamics that we pursued initially as a pedagogical device, and then, with increasing alarm, as a formal proof.

Consider the boundary ∂J_i — the edge of the Jurisdictional Circle. We observe that this boundary exhibits the following properties:

1. **Causal information entering J_i from E_i is destroyed.** Once an external harm is designated as belonging to the Exterior, it cannot re-enter the Interior's accounting. There is no mechanism within PURGE's framework for reclassification.
2. **An observer inside J_i cannot receive signals from E_i.** The JC is, by construction, informationally isolated from downstream events. The citizen knows only what occurs within their circle.
3. **The boundary ∂J_i is an event horizon.**

Figure 2: The Jurisdictional Black Hole. The citizen occupies the singularity at center. The event horizon ∂J_i (solid circle) separates knowable Interior from Exterior. Hawking radiation — labeled here as "guilt" — radiates outward and is immediately reclassified as Jurisdictional Overflow.



This is not a metaphor. We wish it were.

Formally, the **Distributed Accountability Horizon (DAH)** can be described by a modified Schwarzschild metric for moral spacetime:

$$ds^2 = - \left(1 - \frac{r_J}{r}\right) c^2 dt^2 + \left(1 - \frac{r_J}{r}\right)^{-1} dr^2 + r^2 d\Omega^2$$

where r_J is the Jurisdictional Radius (analogous to the Schwarzschild radius), r is the moral distance from the individual, and $d\Omega^2$ is the standard element of causal solid angle. For $r < r_J$ — that is, for events within the JC — the metric is regular and time flows normally. Choices are made. Consequences are tallied.

For $r > r_J$ — the Exterior — the time component changes sign. The inside and outside are, in a precise mathematical sense, **causally disconnected**. What happens out there does not, cannot, and according to PURGE, should not reach you.

Theorem (Exterior Volume): Let $\mu(E_i)$ denote the total measure of the Moral Exterior. Then:

$$\mu(E_i) = \mu(\Omega) - \mu(J_i) = \mu(\Omega) - \frac{4}{3} \pi \epsilon_i^3$$

As $\epsilon_i \rightarrow 0$, which our empirical work suggests is the correct limit for most individuals operating within a PURGE-compliant framework:

$$\lim_{\epsilon_i \rightarrow 0} \mu(E_i) = \mu(\Omega)$$

The Exterior is the size of everything. The circle is the size of nothing. The difference approaches zero so slowly it cannot, in practice, be distinguished from zero at all.

We did not expect this result. We have filed it.

6. On the Non-Retrievability of the Measurement

The complete measurement — the full tabulation of $\mu(\mathbf{E}_i)$ across all individuals i within societal system \mathbf{S} — was completed in the autumn of 2019. The data were archived. The archive was transferred to PURGE's central repository under reference number C-4412- Ω .

We have not been able to access reference number C-4412- Ω .

We have been told, by a representative whose name we did not catch, that the archive is sealed. When we asked why it was sealed, we were told that the sealing was itself an archived event and therefore not accessible. When we asked to speak to someone else, we were transferred to a voicemail that has not yet been set up.

This is not, we want to be clear, an obstacle to the conclusions of this paper. The measurement exists. Its existence is the finding. What it contains is, at this point, an empirical question that has been reclassified as a structural one, which means it belongs to the Exterior, which means it is nobody's problem.

The senior author, Dr. H. Vassel-Prynné, submitted his final revisions in November 2019. His subsequent silence has been categorized by the Institute as a Secondary Impact Event.

7. Conclusions

We have shown the following:

1. The Moral Exterior is topologically equivalent to the entire moral universe, minus a small circle.
2. The boundary of the Jurisdictional Circle is formally equivalent to a black hole event horizon, beyond which causal information does not return.
3. In string-theoretic moral space, Secondary Impact Events propagate as responsino strings across multi-dimensional branes, accumulating in the Exterior as conserved causal charge.
4. The total measure of the Exterior approaches the total measure of everything as $\epsilon_i \rightarrow 0$.
5. The measurement has been completed and sealed.
6. We don't recommend reading the measurement.

The implications of these findings for individual moral accountability are outside the scope of this paper.

Acknowledgements

The authors thank the Institute for Responsible Autonomy for partial funding and for declining to answer our follow-up questions promptly or at all. We thank the reviewers, both of whom asked us to add more Greek letters, and one of whom suggested the black hole analogy before we had thought of it ourselves, in a comment that simply read: "*you know what this is.*" We did not, at the time, know what it was. We know now.

We dedicate this paper to Dr. H. Vassel-Prynne, who measured the thing, and to whatever is inside the archive.

We hope it is resting.

References

1. Bureau of Causal Containment (PURGE). *Jurisdictional Responsibility™: What Happens Outside Doesn't Count Inside™*. Institute for Responsible Autonomy, 2017.
2. Hawking, S. W. "Particle creation by black holes." *Communications in Mathematical Physics* 43.3 (1975): 199–220. (See also: *everything*.)
3. Polchinski, J. *String Theory, Vol. 2: Superstring Theory and Beyond*. Cambridge University Press, 1998. (The moral brane formalism extends naturally from Chapter 13. We are not sure Polchinski would agree with this.)
4. Grimshaw, A. "A note on the topology of moral remainder." *Unpublished correspondence*, undated. (Filed under: *archive*. Sealed.)
5. Wormwood, T. Personal emails, 2017–2019. (Available upon request. Not available.)
6. Felbeck, R. "I think we should stop." *Internal memorandum*, October 2019. (Not peer-reviewed.)

Correspondence regarding this paper should be directed to R. Felbeck at the address on file. The address on file is no longer valid. A forwarding address has not been provided. This is consistent with the paper's findings.