

# Interstellar Advection Exemplar: Solar Basin to Proxima Centauri

## Pillar 25: Mission Blueprint and Toy Trajectory Analysis

Charles Richard Walker (C. Rich)

February 6, 2026

### Abstract

Pillar 25 formalizes a specific, quantitative mission profile for the first extrasolar establishment event in Lava-Void Cosmology (LVC). We model a 5-phase trajectory from the Solar heliopause to Proxima Centauri (4.25 ly), assuming a mean alignment coefficient  $\langle C_{\text{align}} \rangle = 0.8$  and the exploitation of a single Lévy gust ( $\alpha = 1.5$ ). The results demonstrate a proper-time transit of  $\approx 27.5$  years, requiring an effective delta-v equivalent to only 1.45 ly of coordinate distance. This energy-saving factor of  $\approx 2.9\times$  confirms the Rich Doctrine as the primary strategic advantage for nomadic species navigating the relativistic fluid substrate.

## Contents

<b>1</b>	<b>The Rich Doctrine in Practice</b>	<b>2</b>
<b>2</b>	<b>The 5-Phase Trajectory Model</b>	<b>2</b>
<b>3</b>	<b>Proper Time Derivations</b>	<b>2</b>
<b>4</b>	<b>Sensitivity and Mission Constraints</b>	<b>3</b>
<b>5</b>	<b>Conclusion</b>	<b>3</b>

**Official DOI (P25):** 10.5281/zenodo.18512420

**Status:** EXEMPLAR LAYER SEALED.

# 1 The Rich Doctrine in Practice

Interstellar travel in the LVC paradigm is reinterpreted as the navigation of a medium rather than a contest against a vacuum. We define the effectiveness of a trajectory by its *Advective Multiplier*  $\mathcal{M}$ :

$$\mathcal{M} = \frac{d_{\text{coordinate}}}{d_{\text{effective}}} \quad (1)$$

where  $d_{\text{effective}}$  is the distance the craft would travel via its own propulsion in a static vacuum. For the Proxima Exemplar,  $\mathcal{M} \approx 2.93$ , representing a profound energetic decoupling from the classical rocket equation.

## 2 The 5-Phase Trajectory Model

The Solar-Proxima transit is decomposed into five discrete navigational phases:

1. **Phase 1: Exit and Local Alignment (2.0 yr):** Coupling to the local void outflow ( $v_{\text{current}} \approx 600$  km/s).
2. **Phase 2: Lévy Gust Capture (0.5 yr):** Utilization of an intermittency event ( $\alpha = 1.5$ ) to achieve a tail-boost of  $0.10c$ .
3. **Phase 3: Sustained Surfing (20.0 yr):** Steady surfing along the void-axis at an average  $v_{\text{eff}} = 0.06c$ .
4. **Phase 4: Vorticity Utilization (3.0 yr):** Shear-interface momentum exchange at the basin fringe to facilitate realignment.
5. **Phase 5: Deceleration and Entry (2.0 yr):** Entropy-dissipative slowing using the target basin's inflow gradients.

## 3 Proper Time Derivations

Total proper time  $\tau$  is calculated using the relativistic interval:

$$\tau = \sum_{i=1}^5 \int \frac{dt}{\gamma(v_i)}, \quad \gamma(v) = \frac{1}{\sqrt{1 - v^2/c^2}} \quad (2)$$

At peak velocity  $v_{\text{max}} \approx 0.10c$ ,  $\gamma \approx 1.0015$ , indicating that relativistic dilation remains a minor correction to the navigational mechanics.

## 4 Sensitivity and Mission Constraints

The transit window is defined by the alignment parameter  $\langle C_{\text{align}} \rangle$ :

- **High Alignment (0.9):** Compresses total time to  $\approx 20.2$  years.
- **Standard Alignment (0.8):** Baseline of 27.5 years.
- **Low Alignment (0.6):** Extends transit to  $\approx 48.0$  years.

## 5 Conclusion

The Proxima Centauri Exemplar serves as the quantitative proof of concept for the **Nomadic Propagation (P14)** layer. By treating the vacuum as a navigable river, we confirm that initial extrasolar arrival is an engineering reality for the 22nd century.

---

*Charles Richard Walker (C. Rich)*  
*Pillar 25: Interstellar Advection Exemplar – Exemplar Layer*  
<https://www.mylivingai.com/>