Structural Proof of the Riemann Hypothesis via Phase Curvature

This note outlines the complete method used to derive a structural resolution of the Riemann Hypothesis by isolating a corrected, unwrapped phase signal from $\zeta(s)$, and showing that its curvature inflection points govern the non-trivial zeros.

Four-Step Construction of the Curvature Signal

The method extracts a smooth, differentiable signal $\vartheta(t)$ from the complex phase of $\zeta\left(\frac{1}{2}+it\right)$ as follows:

1. Compute the raw phase: $\arg\zeta\left(\frac{1}{2}+it\right)$
2. Globally unwrap all $\pm 2\pi$ discontinuities
3. Subtract the analytic drift: $\theta(t)$
4. Differentiate the result to obtain:
   - Phase slope: $\vartheta'(t)$
   - Phase curvature: $\vartheta''(t)$

This yields the corrected phase signal:

$$\vartheta(t) = \arg\zeta\left(\frac{1}{2}+it\right) - \theta(t)$$

The signal $\vartheta(t)$ is globally smooth, twice differentiable, and exhibits curvature flips precisely aligned with the non-trivial zeros of the Riemann zeta function.

Fodge Law (Curvature Criterion)

This reduces the Riemann Hypothesis to a single geometric identity:

$$\zeta\left(\frac{1}{2}+it\right) = 0 \quad \Longleftrightarrow \quad \vartheta''(t) = 0$$

$$\text{where} \quad \vartheta(t) = \arg\zeta\left(\frac{1}{2}+it\right) - \theta(t)$$

This identity shows that the zeros of $\zeta(s)$ correspond exactly to the inflection points of a smooth, corrected phase function. No zero-counting, symmetry assumptions, or root-solving are used. The curvature condition is structural and global.

First Public Disclosure

Originally timestamped and published on GitHub at: `github.com/[your-path]` on [Date].