Active Screen Gravity (ASG) — Full Theory Summary

1. Motivation

The Active Screen Gravity (ASG) model extends Starobinsky inflation by introducing a running effective Planck mass $F(\chi)$ motivated by renormalization group (RG) flow.
Instead of modifying only the potential $V(\chi)$, the model modifies the geometry of field space, altering the inflationary dynamics in a physically distinguishable way.

2. Core Mechanism

In the Einstein frame the effective potential is $U = V/F^2$.
As the field rolls down V, the RG deformation causes F to decrease, partially cancelling the slope of the potential.
This creates an ultra-flat effective plateau without fine tuning of V itself.

3. Observable Consequences

Two coupled predictions emerge:
1) Spectral tilt n_s is controlled primarily by curvature of F (second derivative).
2) Tensor amplitude r is controlled by slope of F (first derivative).

This creates a correlation between n_s and r unlike alpha-attractors where they are largely independent.

4. Tensor Suppression

The tensor-to-scalar ratio is suppressed according to:
$r(\beta) \approx r_0 (1 - \gamma\beta)^2$
For $\beta \approx 0.02$ the model predicts $r \sim 10^{-4}$, significantly below the standard Starobinsky prediction (~ 0.003).

5. Numerical Results

A scan in β shows a trajectory in the (n_s, r) plane moving leftward and downward:
- decreasing n_s into the Planck preferred region
- strongly suppressing r
This trajectory is a unique observational signature of ASG.

6. Distinction From Other Models

Starobinsky: fixed prediction near (0.968, 0.003)
Alpha-attractors: adjustable r but independent of n_s
ASG: coupled shift — lower r requires redder n_s

Therefore future CMB missions can falsify or confirm the model.

7. Experimental Forecast

If future experiments detect $r \approx 0.003$ → favors Starobinsky
If $r < 10^{-3}$ but $\sim 10^{-4}$ detected → supports ASG running Planck mass scenario

8. Physical Interpretation

The RG flow dynamically screens gravitational strength at high energies.
Inflation ends not by steepening of V but by restoration of the Planck mass scale.
Thus the geometry of gravity itself controls the inflationary observables.