A. The Sparsity Trap

PCC at 8μm

- 0.511 — A (8μm MSE)
- 0.253 — D (2μm MSE) — COLLAPSE -51%
- 0.510 — E (2μm Poisson)
- 0.526 — V7 (Multi-scale)

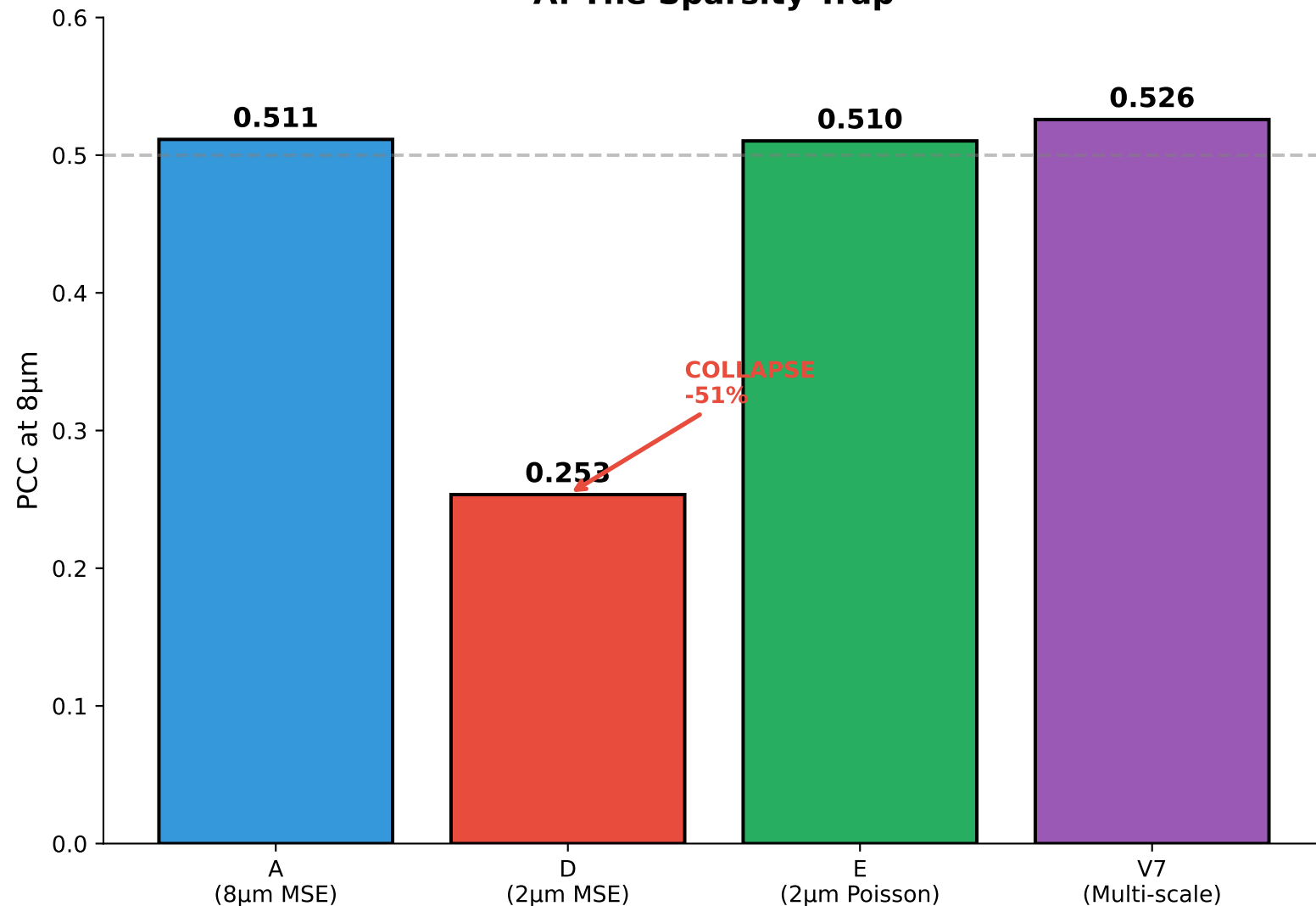**B. Summary**

Key Findings:

1. THE SPARSITY TRAP
   Model D (MSE on 2μm): PCC = 0.253
   Model E (Poisson on 2μm): PCC = 0.510
   → Poisson prevents regression-to-mean

2. THE RECOVERY PROOF
   Model A (trained on 8μm): PCC = 0.511
   Model E (trained on 2μm): PCC = 0.510
   → 2μm data IS usable with correct loss

3. THE DENSITY CEILING
   All methods: PCC_2μm ≈ 0.35
   → Stochastic noise caps pixel-wise correlation
   → Use SSIM for fine structure evaluation