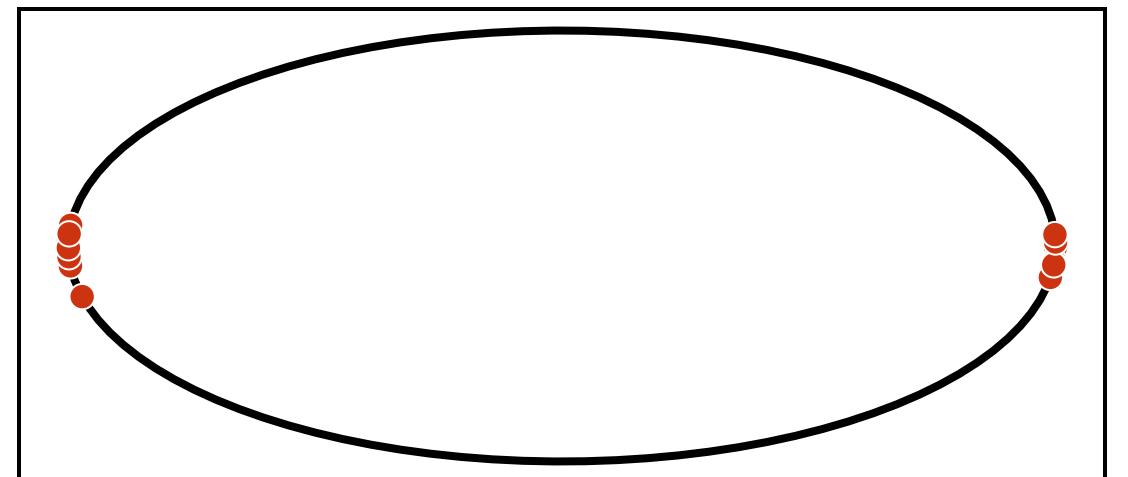
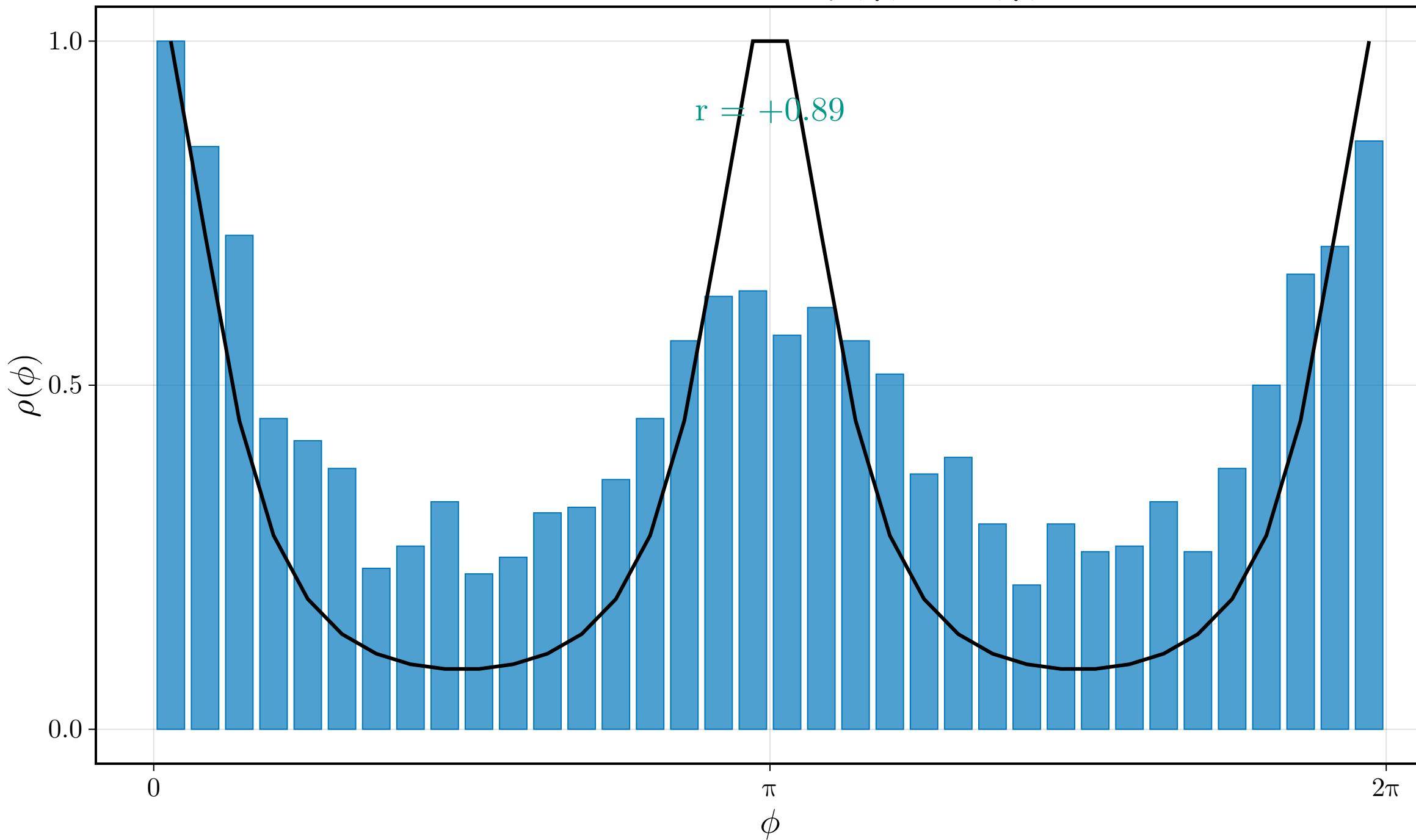


Curvature-Induced Clustering: A Non-Equilibrium Steady State

System: N=40 particles on ellipse



MAIN RESULT: $\rho(\varphi) \propto \kappa(\varphi)$



100%

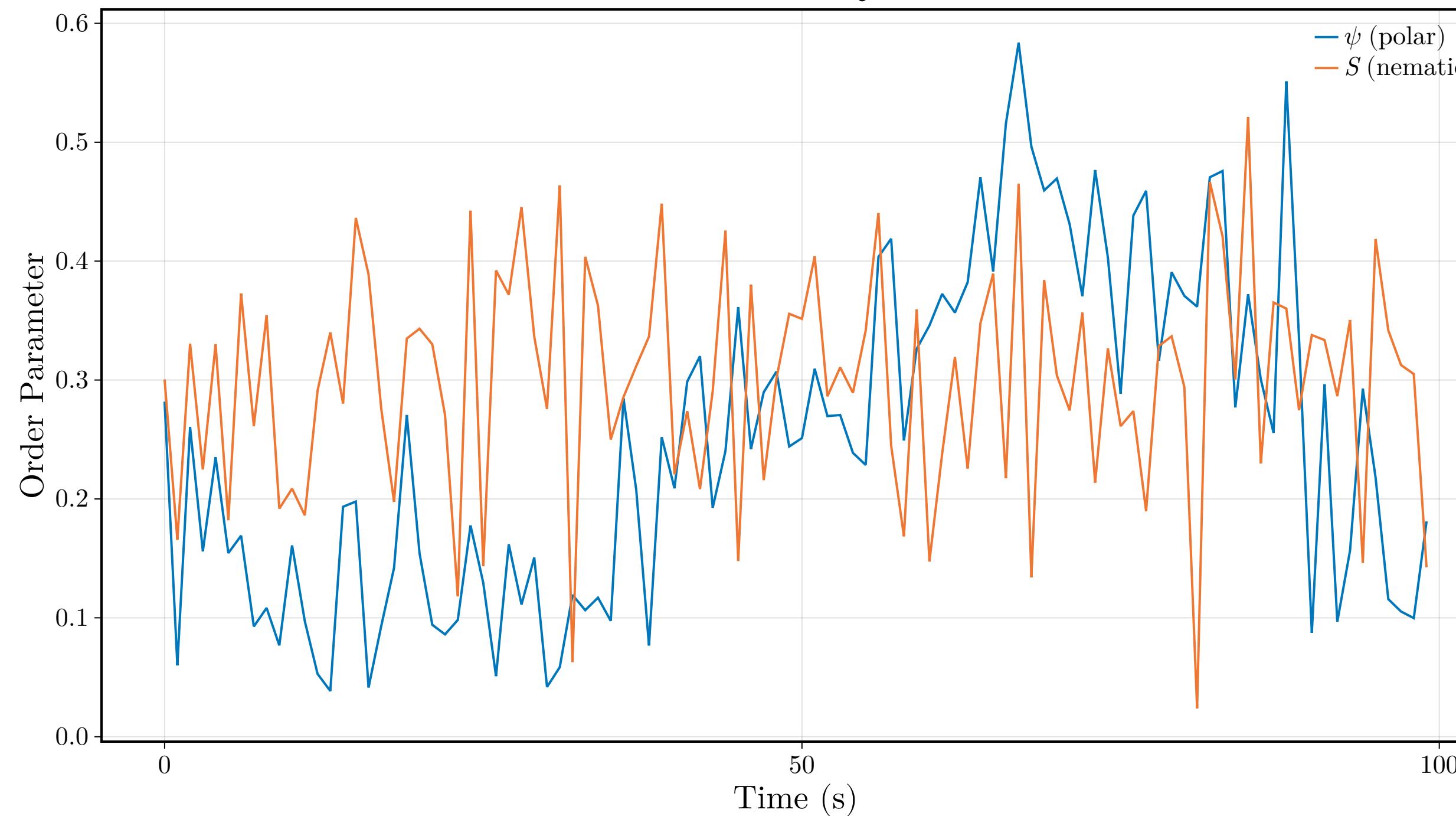
clustering
at e=0.9

$\tau = 15s$

formation
time

Two-Cluster Dynamics

Physical Mechanism



1. High curvature \rightarrow particles slow down
2. Slower particles \rightarrow more collisions
3. Collisions trap particles locally
4. Clusters form at curvature maxima

Key equation:
 $\rho(\varphi) \propto \kappa(\varphi)^{2/3}$