

III. Gravity in a cavity

- As a gradient flow, Ricci flow can potentially provide paths in the space of metrics connecting different saddle points of the action.
- From a world-sheet point of view, such paths are RG trajectories, of which the saddle points are the UV and IR fixed points.
- A simple and interesting Euclidean gravitational system with multiple saddle points is the thermal ensemble for gravity in a box.
- For concreteness, we chose:

$$D=4$$

$$\Lambda=0$$

spherical box of fixed radius R

- The path integral involves summing over topologies and integrating over Euclidean metrics with boundary

$$S^1_{\beta} \times S^2_R$$