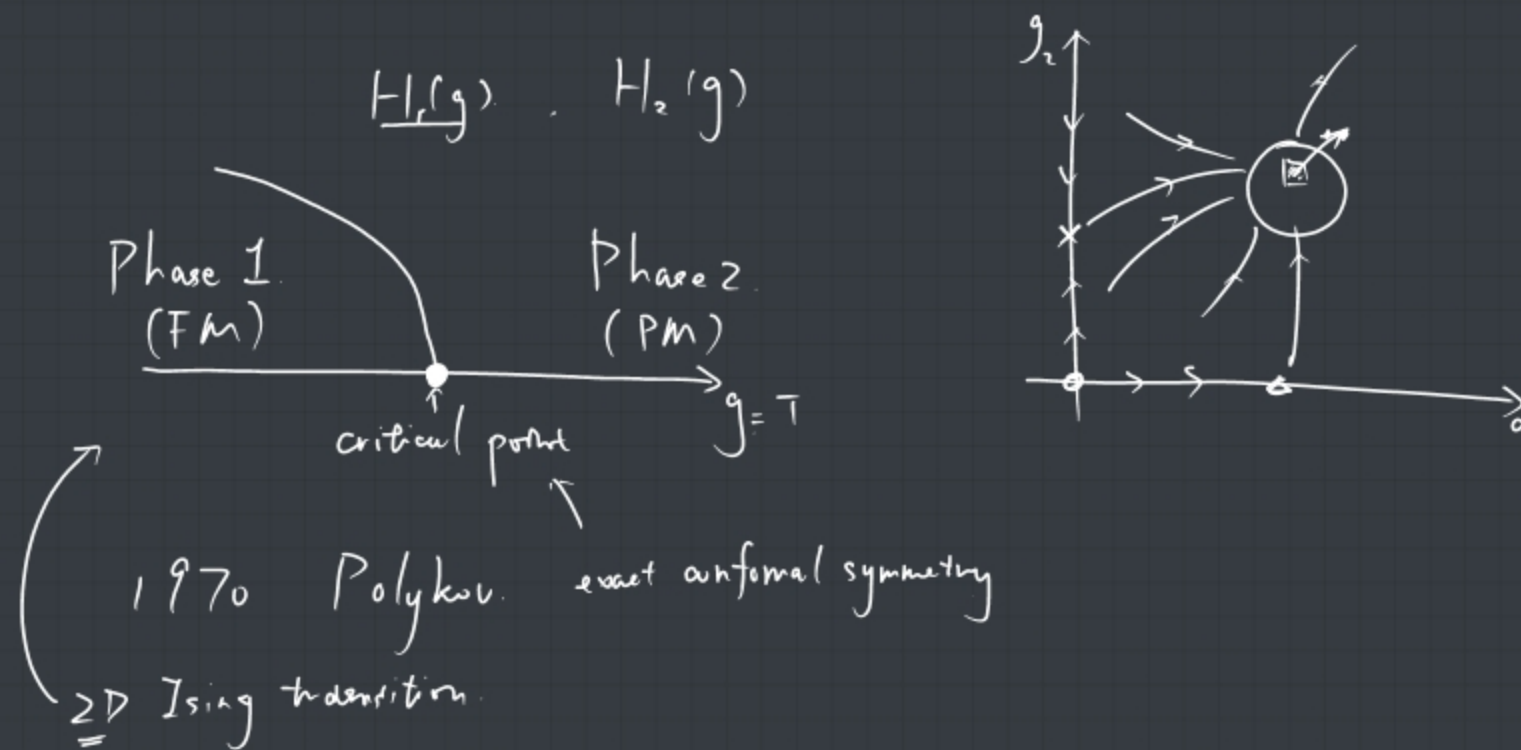


- Phase transition / Critical Phenomena / universality
- $d=3$ CFT



"Fuzzy sphere regularization"

1. Motivation from CFT $\leftarrow$
2. Landau level on the sphere geometry
3. Example 3D Ising transition (e.g. scaling of $OP E$ data)
4. More applications

* We try to study the emergence of conformal sym in microscopic models

* CFT data

• translation P_μ

• rotation $M_{\mu\nu}$

• dilatation D

SCT K_μ

commutator:

$$[D, P_\mu] = P_\mu$$

$$[D, K_\mu] = -K_\mu$$

conformal tower structure

simple harmonics

$H, a^\dagger, a$

$[H, a^\dagger] = \underline{a^\dagger}$

$[H, a] = -\underline{a}$

$$H \sim$$

$$a^\dagger \sim P_\mu$$

$$a \sim K_\mu$$

$$D|\phi\rangle = \Delta_\phi |\phi\rangle \quad \text{CFT state}$$

$$\lim_{r \rightarrow 0} \phi(r) |0\rangle \equiv |\phi\rangle$$

scaling dim. (conformal dim)

$$D(P_\mu |\phi\rangle) = (\Delta_\phi + 1)(P_\mu |\phi\rangle)$$

$$D(K_\mu |\phi\rangle) = (\Delta_\phi - 1)(K_\mu |\phi\rangle)$$

ground state

$$a|\psi_0\rangle = 0$$

scaling dim. of CFT states

$$K_\mu |\phi\rangle = 0 \rightarrow \text{primary field}$$

$\leftarrow P_\mu^2 |\phi\rangle, P_\mu P_\nu |\phi\rangle$
 $\leftarrow P_\mu |\phi\rangle$
 $\leftarrow \text{primary } |\phi\rangle$

