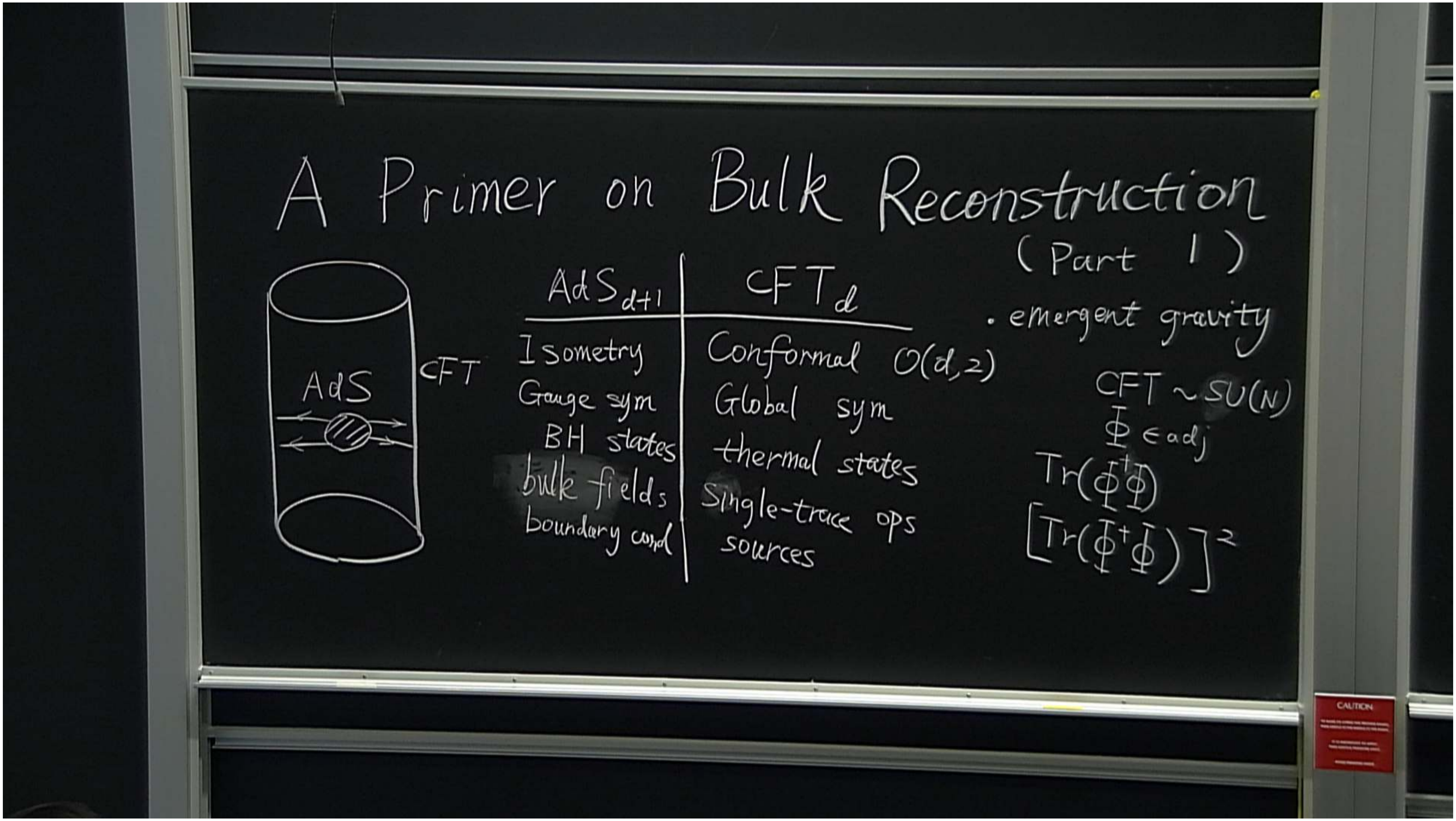
Title: Focus Lecture

Date: Jul 25, 2016 05:00 PM

URL: http://pirsa.org/16070038

Abstract:


A Primer on Bulk Reconstruction
(Part 1)
AdS
CFT
AdS_{d+1} | CFT_d
Isometry | Conformal $O(d,2)$
Gauge sym | Global sym
BH states | thermal states
bulk fields | Single-trace ops
boundary cond | sources
. emergent gravity
CFT ~ SU(N)
$\Phi \in adj$
$Tr(\Phi^\dagger \Phi)$
$[Tr(\Phi^\dagger \Phi)]^2$

Correlators:

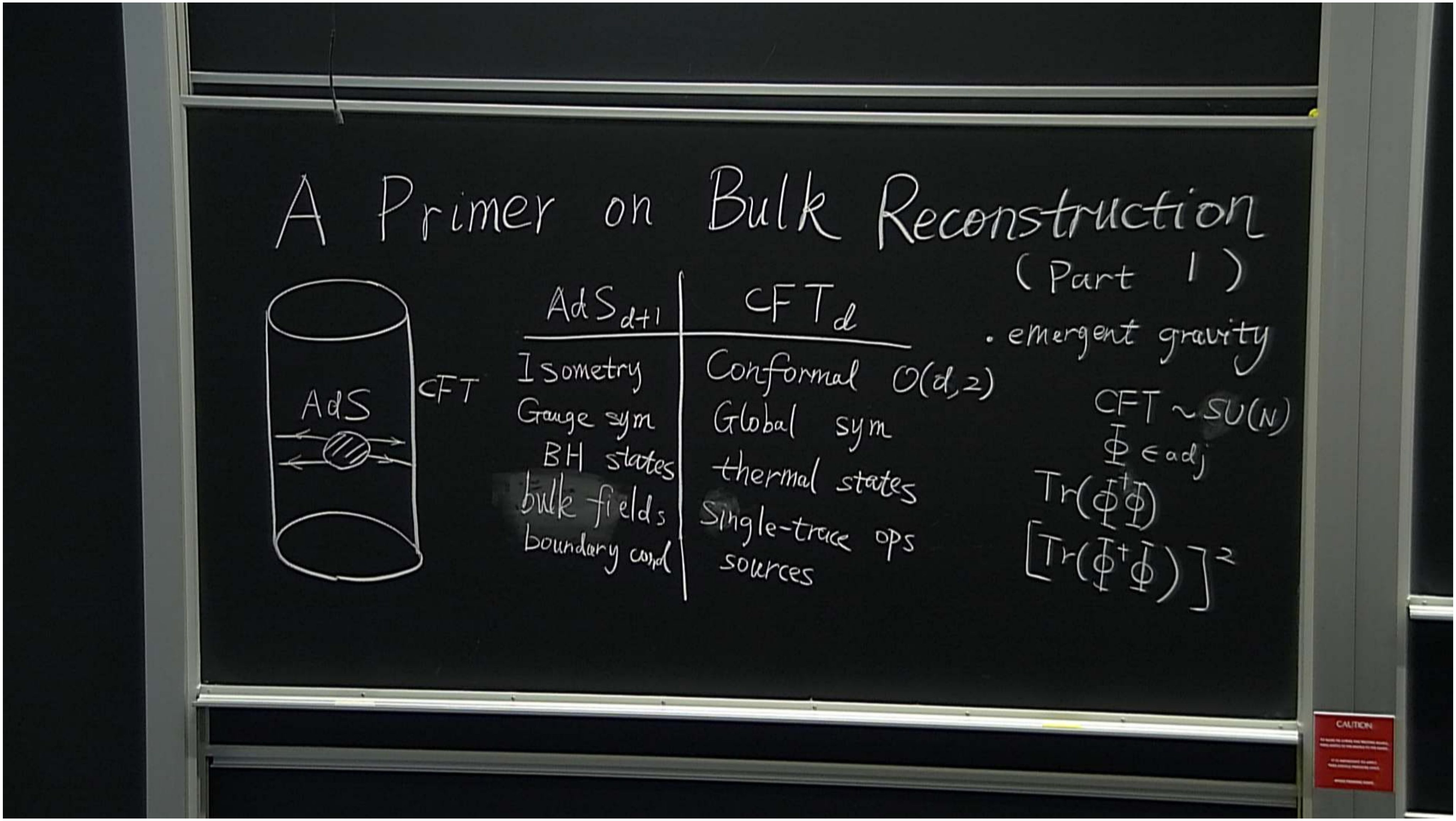
1) Differentiate dictionary (GKPW)

$$Z_{CFT}[\phi_0] = Z_{grav}[\phi_0]$$

$$\int D\Phi\, e^{-S + \int_x \phi_0 \mathcal{O}}$$

$$\langle \mathcal{O}(x_1) \cdots \mathcal{O}(x_n) \rangle = \frac{\delta^n Z_{grav}}{\delta\phi_0(x_1) \cdots \delta\phi_0(x_n)}$$

2) Extrapolate dictionary (BDHM)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$CFT \sim SU(N)$
$\Phi \in adj$
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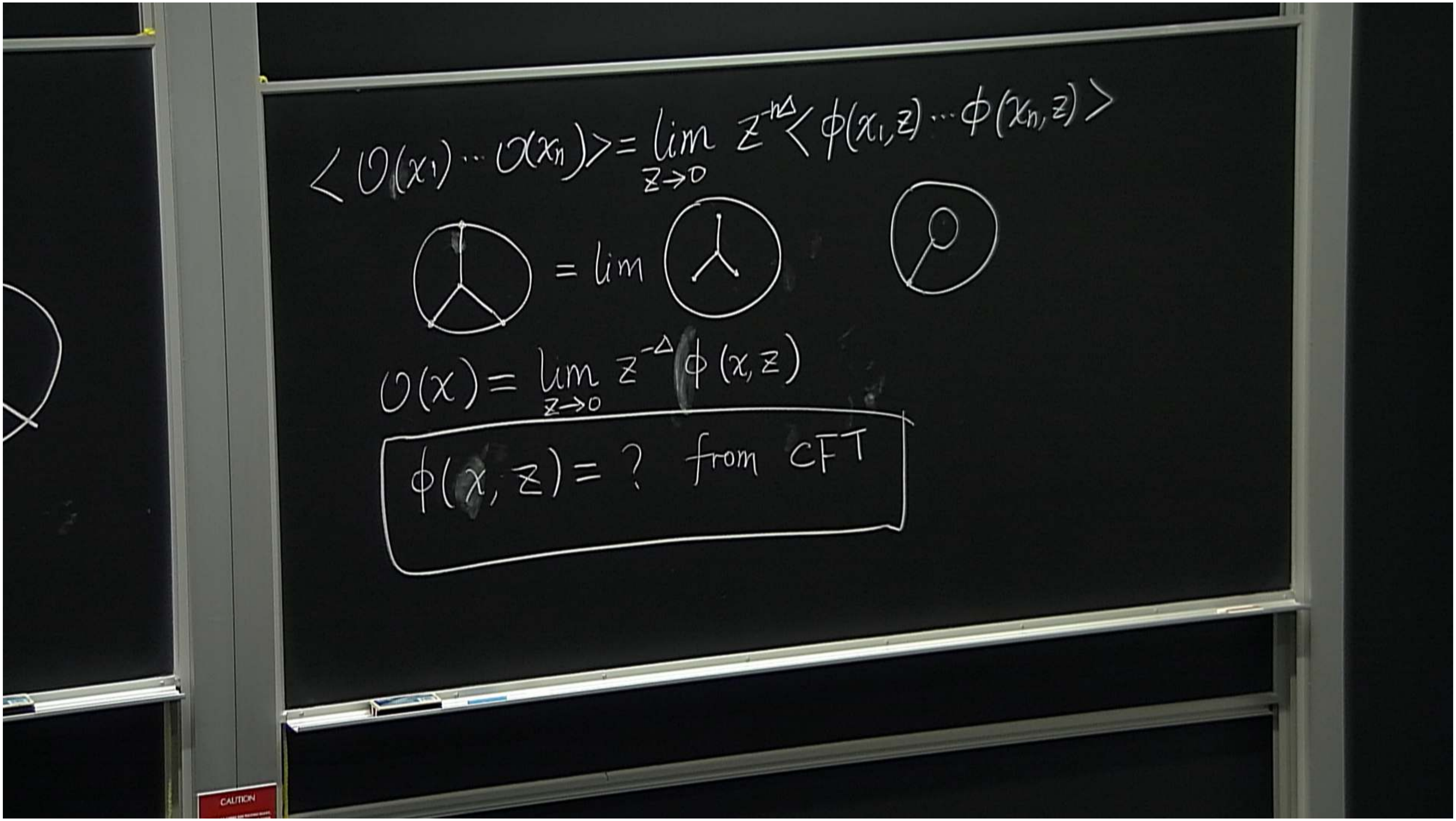
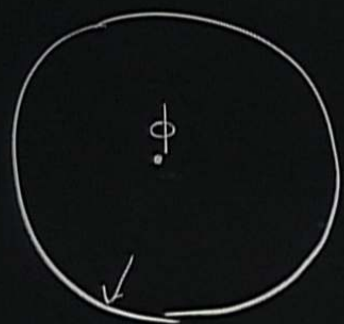

$\langle \mathcal{O}(x_1)\cdots\mathcal{O}(x_n)\rangle = \lim_{z\to 0} z^{-n\Delta}\langle \phi(x_1,z)\cdots\phi(x_n,z)\rangle$
$= \lim$
$\mathcal{O}(x) = \lim_{z\to 0} z^{-\Delta}\phi(x,z)$
$\phi(x,z) = ?$ from CFT



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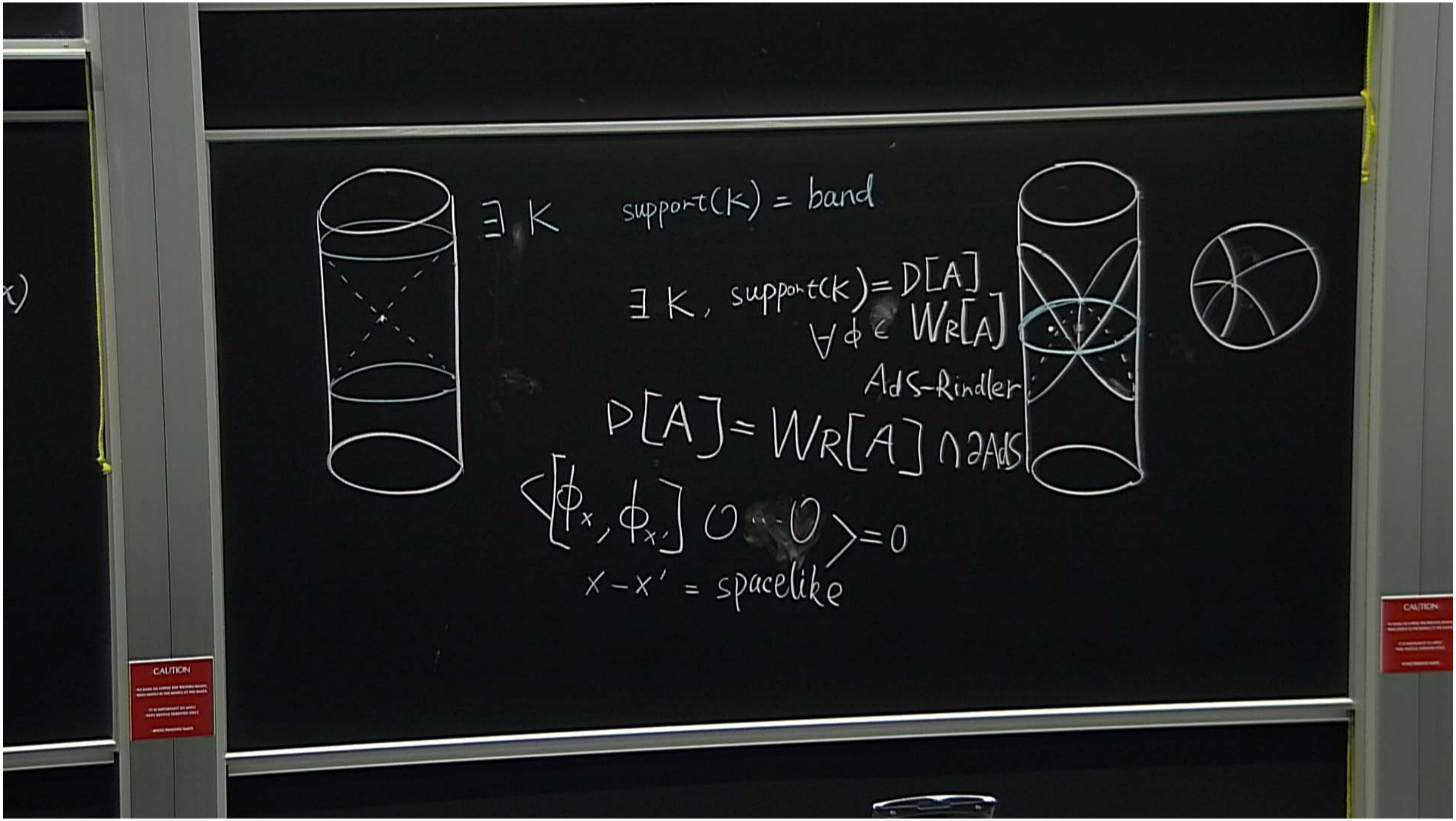
$$(\nabla^2 - m^2)\phi(x,z) = \overset{\lambda\phi^2}{0}\,, \quad \lim_{z\to 0} z^{-\Delta}\phi(x,z) = \mathcal{O}(x)$$

$$\phi(x,z) = \int dx'\, K(x,z;x')\,\mathcal{O}(x')$$

K	K_{Witten}
Evolves $\mathcal{O}$ to AdS	Evolves ϕ_0 to AdS
$z\to 0$: $\sim z^{\Delta}\delta(x-x')$	$\sim z^{d-\Delta}\delta(x-x')$


∃ K   support(K) = band
∃ K, support(K) = D[A]
∀ ϕ ∈ W_R[A]
AdS-Rindler
D[A] = W_R[A] ∩ ∂AdS
⟨[ϕ_x, ϕ_x'] O ⋯ O⟩ = 0
x − x' = spacelike
CAUTION
CAUTION