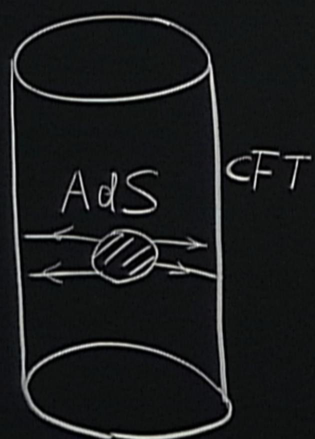
Title: Focus Lecture

Date: Jul 25, 2016 05:00 PM

URL: http://pirsa.org/16070038

Abstract:

A Primer on Bulk Reconstruction
(Part 1)



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

$CFT \sim SU(N)$

$\Phi \in adj$

$Tr(\Phi^\dagger \Phi)$

$[Tr(\Phi^\dagger \Phi)]^2$

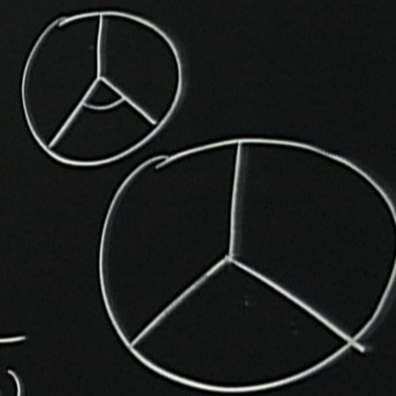
Correlators:

1) Differentiate dictionary (GKPW)

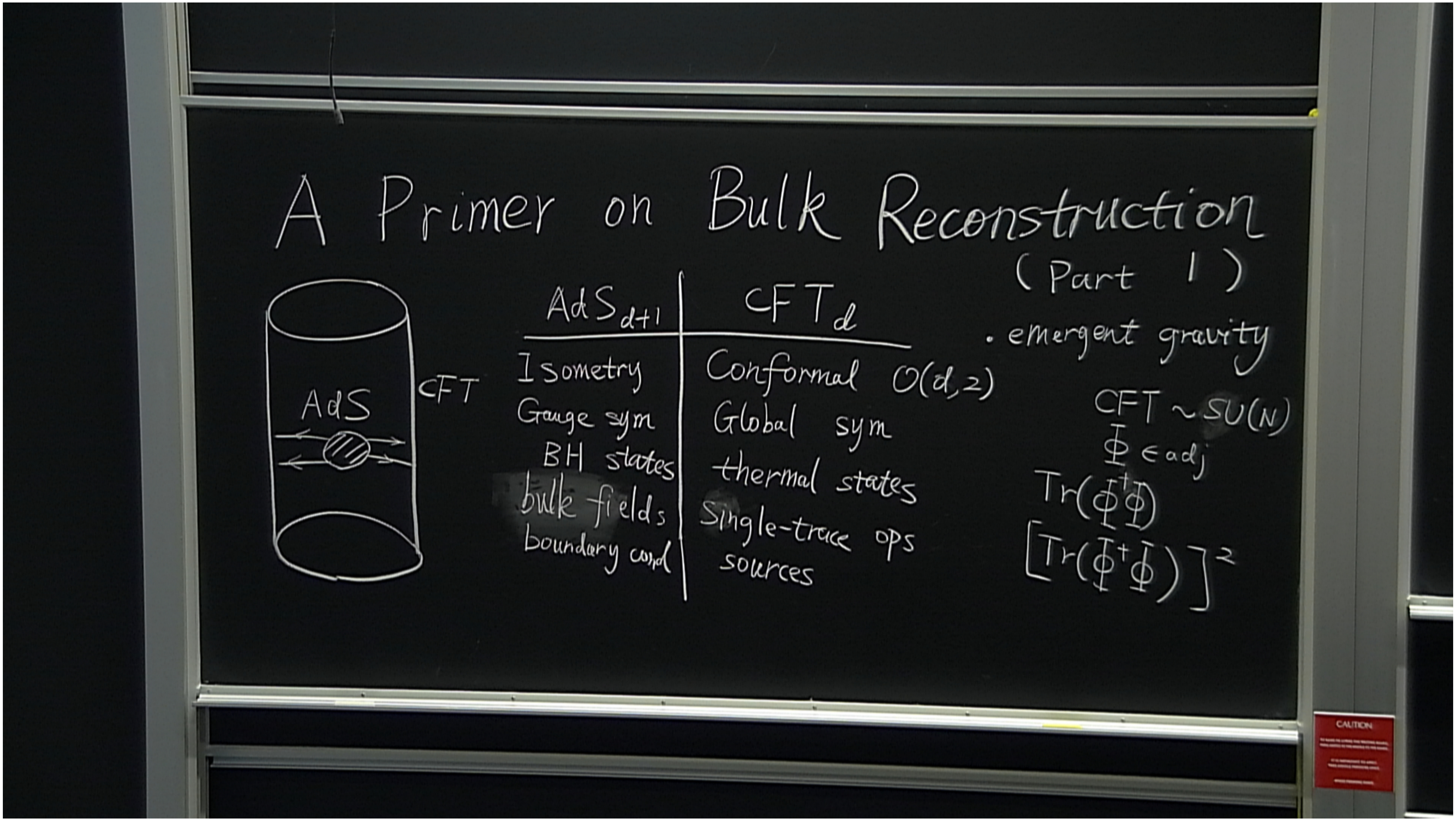
$$Z_{CFT}[\phi_0] = Z_{grav}[\phi_0]$$

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

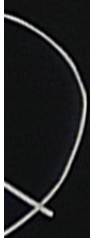
$$\langle \mathcal{O}(x_1) \cdots \mathcal{O}(x_n) \rangle = \frac{\delta^n Z_{grav}}{\delta \phi_0(x_1) \cdots \delta \phi_0(x_n)}$$



2) Extrapolate dictionary (BDHM)


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
$\mathrm{Tr}(\Phi^\dagger \Phi)$
$[\mathrm{Tr}(\Phi^\dagger \Phi)]^2$
CAUTION

$$\langle O(x_1)\cdots O(x_n)\rangle = \lim_{z\to 0} z^{-n\Delta}\langle \phi(x_1,z)\cdots\phi(x_n,z)\rangle$$



 $= \lim$ 

$$O(x) = \lim_{z\to 0} z^{-\Delta}\,\phi(x,z)$$

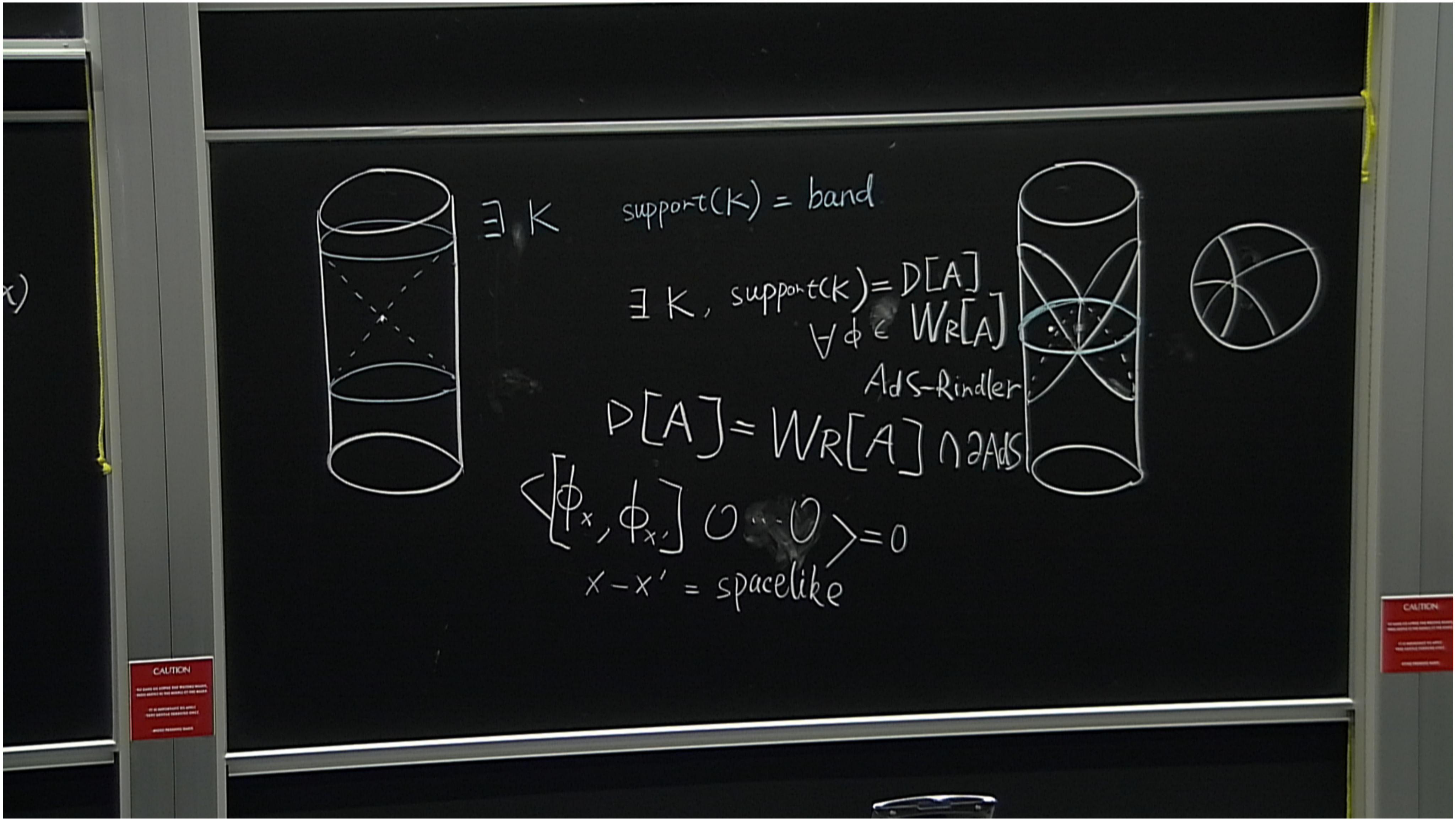
$$\boxed{\phi(x,z) = ?\ \text{ from CFT}}$$

HKLL hep-th/0506118
0606141

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

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

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



$\exists K$
support(K) = band
$\exists K$, support(K) = $D[A]$
$\forall \phi \in W_R[A]$
AdS-Rindler
$D[A] = W_R[A] \cap \partial AdS$
$\langle [\phi_x, \phi_{x'}] \, O \cdots O \rangle = 0$
$x - x' =$ spacelike