Title: Research Talk 1 - Cosmic ER=EPR

Speakers: Andrew Strominger

Collection: Strings 2023

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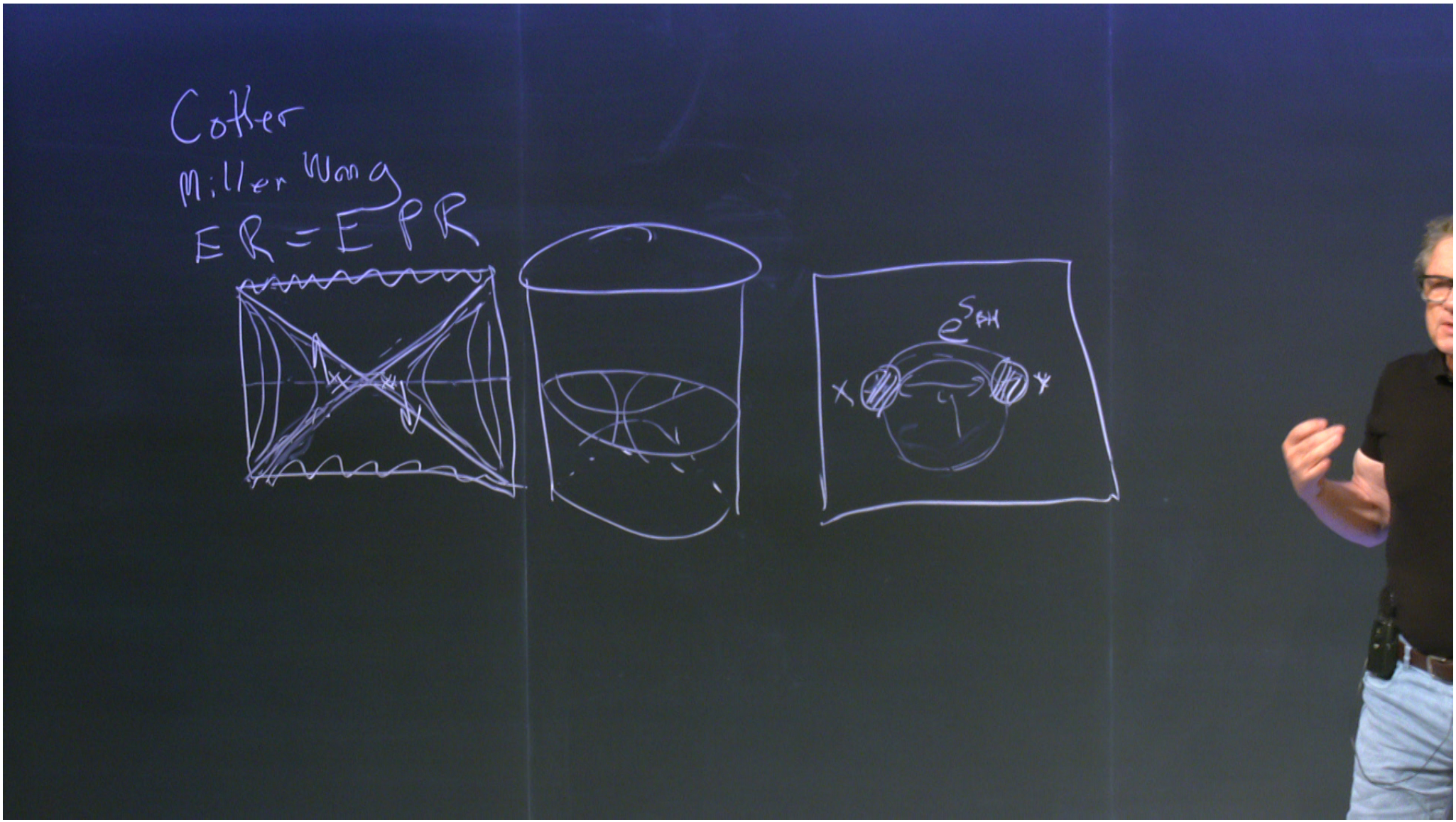
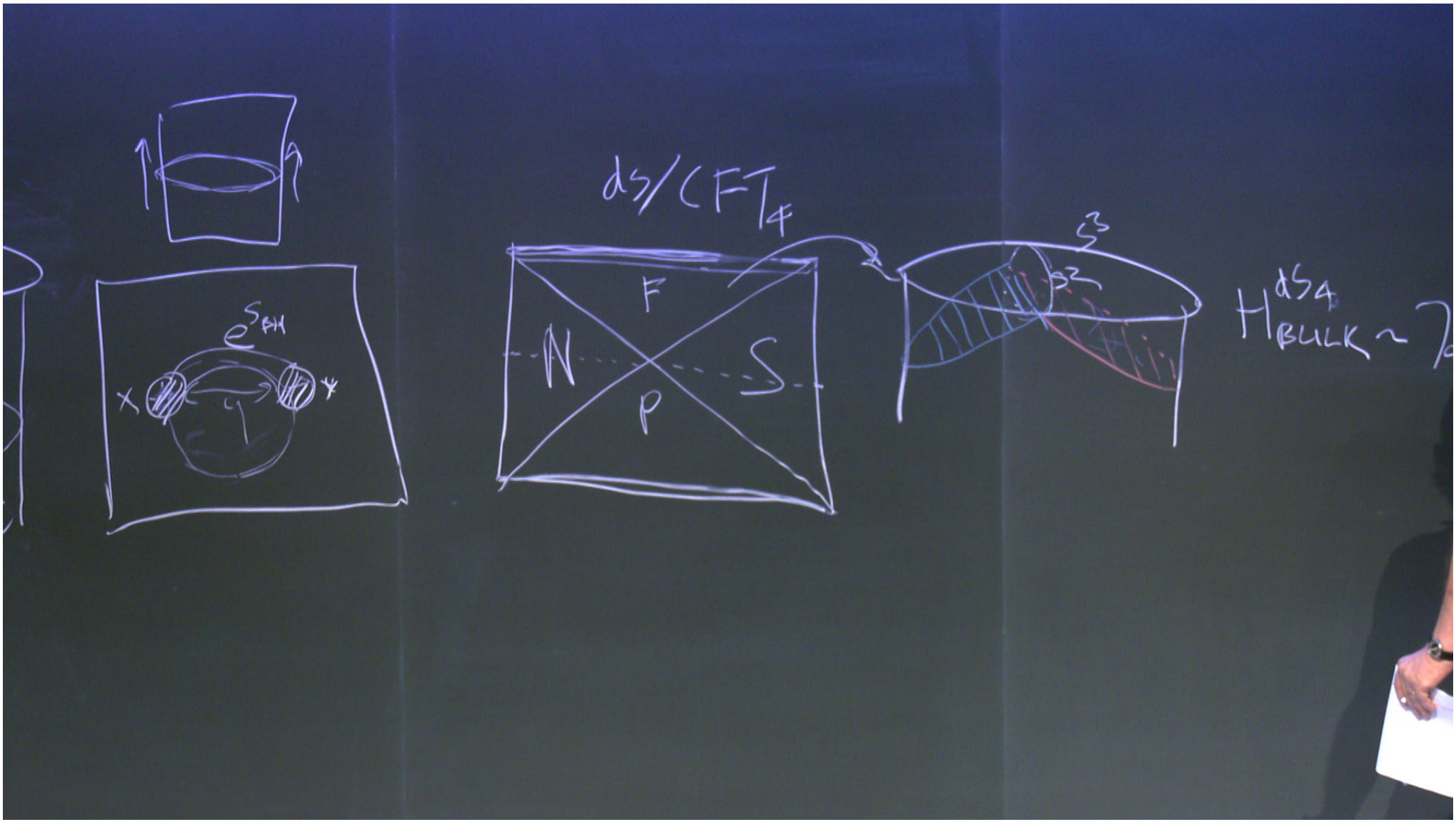
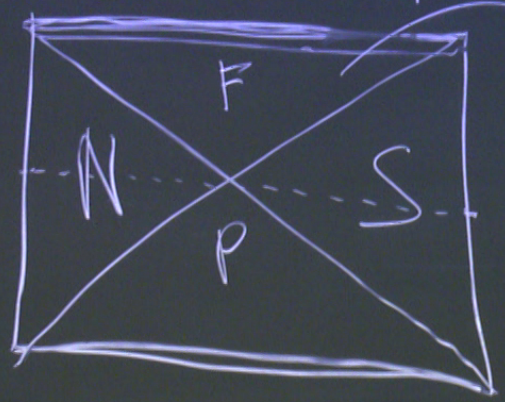
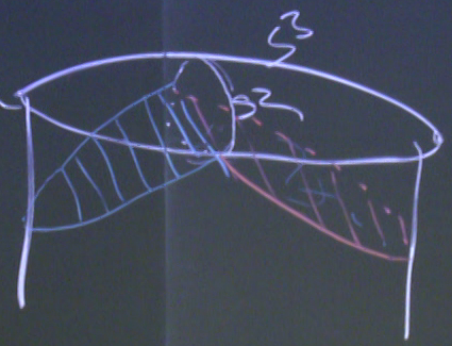
URL: https://pirsa.org/23070016


Cotler
Miller Wang
ER = EPR
$e^{S_{BH}}$
X
Y

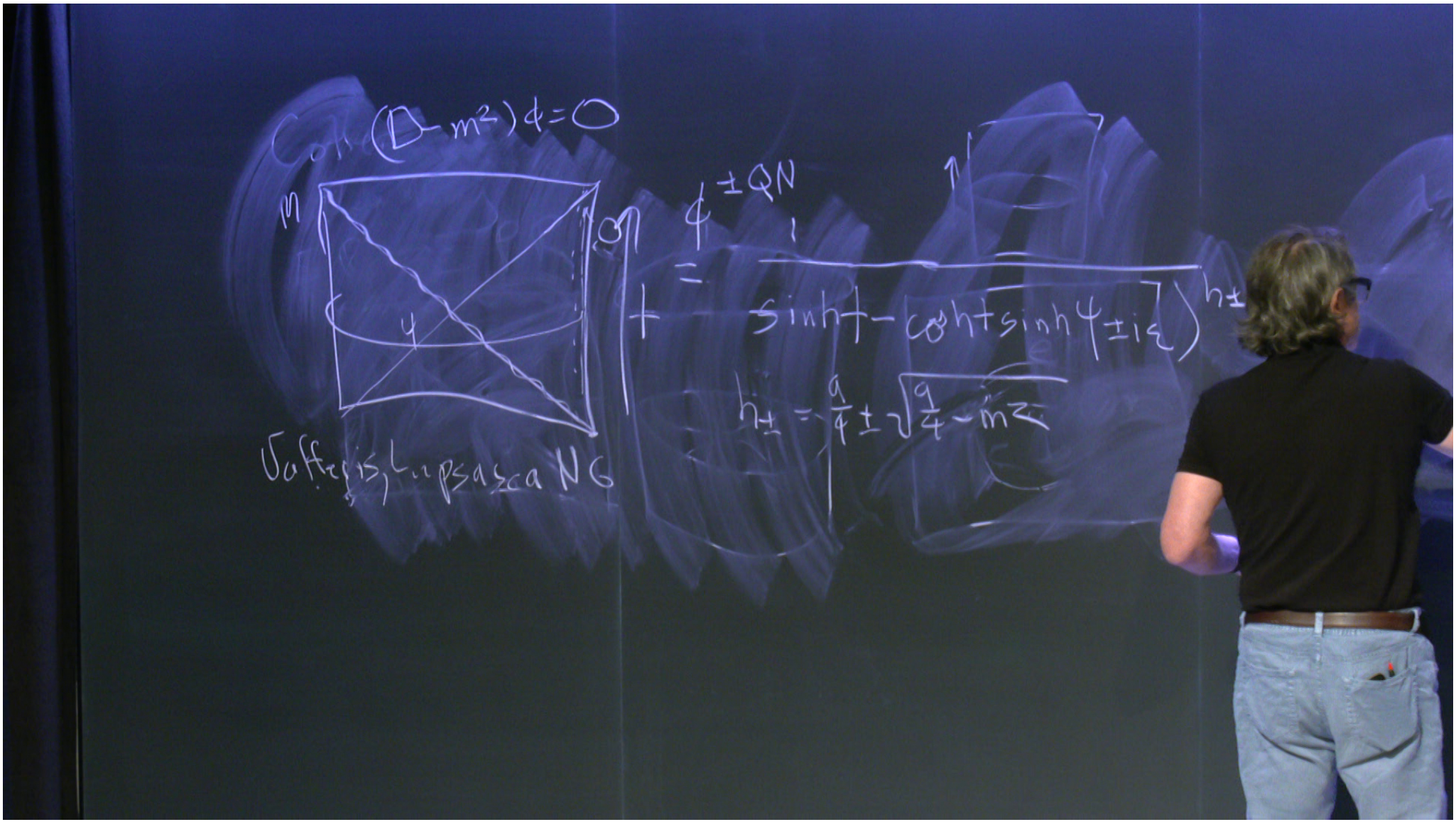

dS/CFT4
F
N
S
P
S3
S2
H dS4 BULK ~ Z

dS/CFT_4

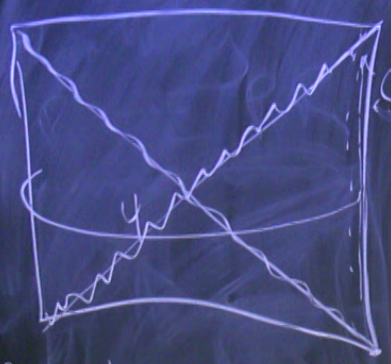




$$\mathcal{H}^{dS_4}_{BULK} \sim \mathcal{H}_{CFT_3} \otimes \mathcal{H}_{CFT_3}$$


(D − m²)φ = 0
M
O
φ
Suffeqis, Lupsasca NG
φ ± QN
h±

$(\Box - m^2)\phi = 0$



Suffices, I suppose a NG

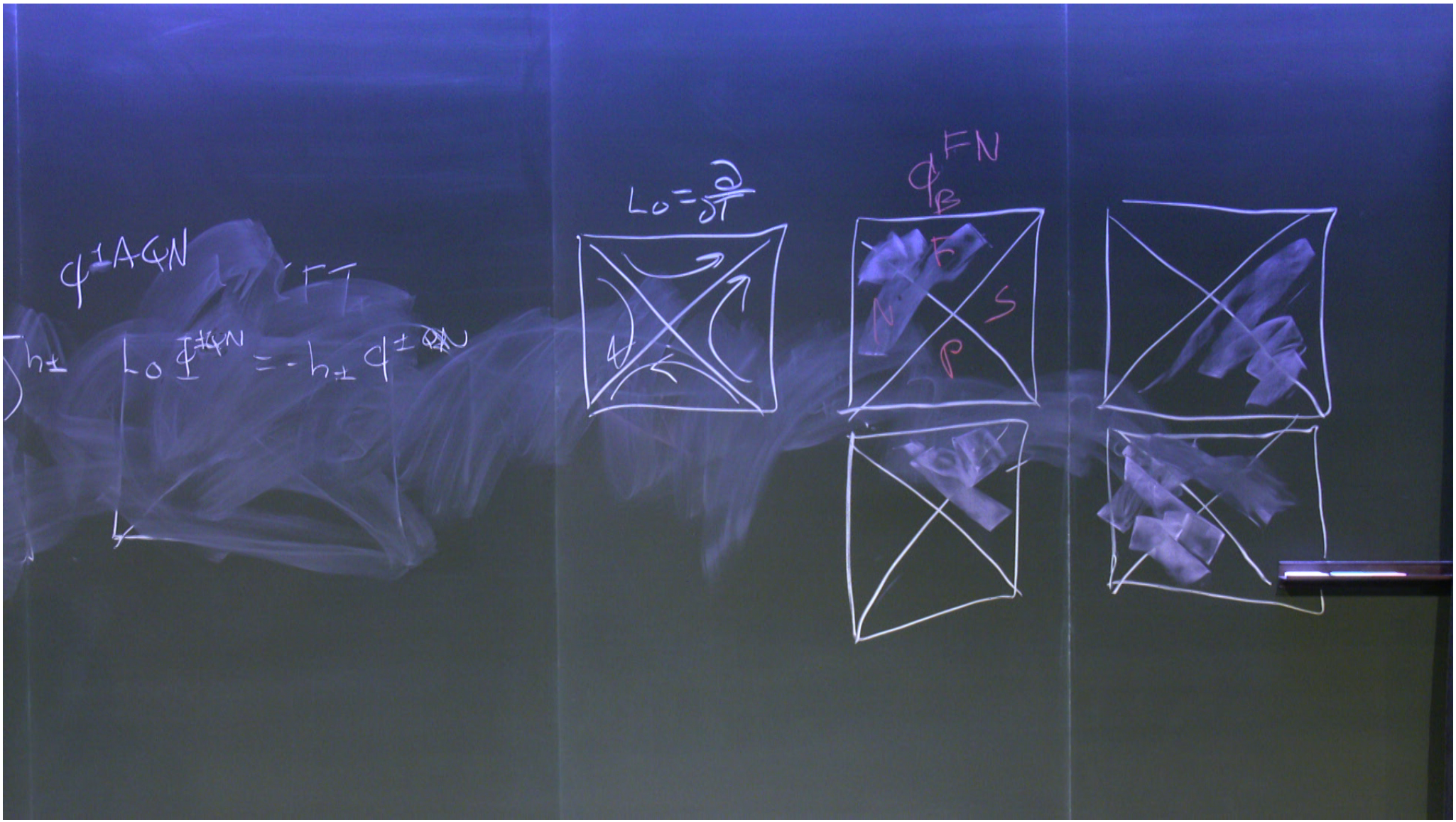
$$\phi^{\pm QN} = \frac{1}{(\sinh t - \cosh t \sinh \psi \pm i\epsilon)^{h_\pm}}$$

$$h_\pm = \frac{d}{2} \pm \sqrt{\frac{d^2}{4} - m^2}$$

$\phi^{\pm AdS}$

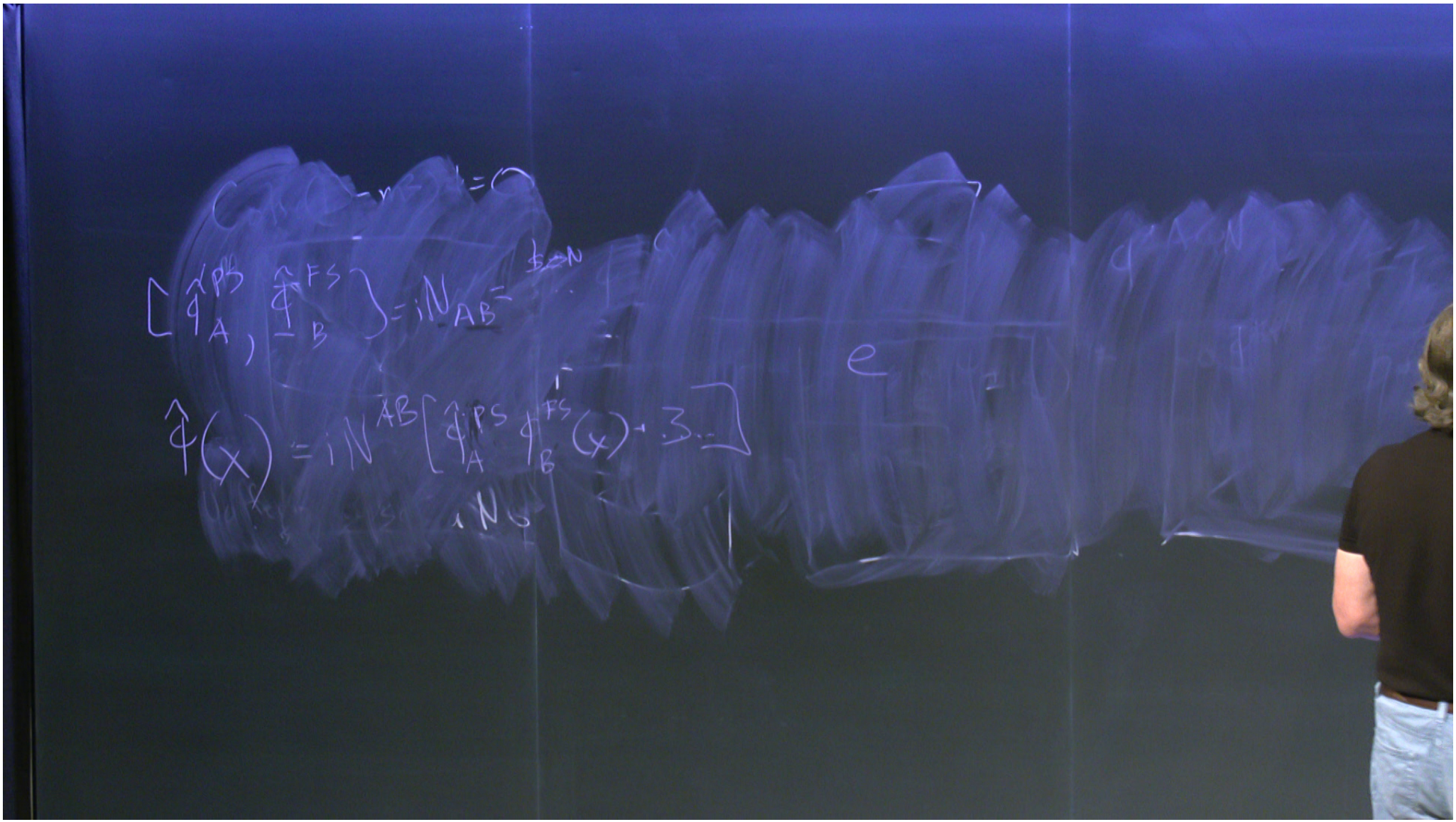
CFT

$$L_0 \phi^{\pm QN} = -h_\pm \phi^{\pm QN}$$


$\varphi^{\pm AGN}$
$h_\pm$
$L_0 \Phi^{\pm AGN} = -h_\pm \varphi^{\pm AGN}$
$L_0 = \frac{\partial}{\partial T}$
φ_B^{FN}
F
N
S
P

$$\left[\hat{q}_A^{PS}, \hat{q}_B^{FS}\right] = iN_{AB}$$

$$\hat{\varphi}(x) = iN^{AB}\left[\hat{q}_A^{PS}\, q_B^{FS}(x) + \ldots\right]$$


$[\hat{q}^{PS}_A, \hat{q}^{FS}_B] = iN_{AB}$
$\hat{q}(x) = iN^{AB}[\hat{q}^{PS}_A \hat{q}^{FS}_B(x) + \ldots]$

$$\hat{\phi}^{FS}_{B} \Big\} = iN_{AB}$$

$$|0_E\rangle e^{ie^{i\pi L_0 N^{AB} \hat{\phi}^{PS}_{A} \hat{\phi}^{FN}_{N}}} |0_3\rangle$$

$$= iN^{AB}\left[\hat{\phi}^{PS}_{A} \hat{\phi}^{FS}_{B}(x) \cdots 3 \cdots\right]$$

$$\mathrm{Tr}_N |0_E\rangle\langle 0_E| = e^{-2\pi i L_0} = e^{-2\pi i H_{static}}$$