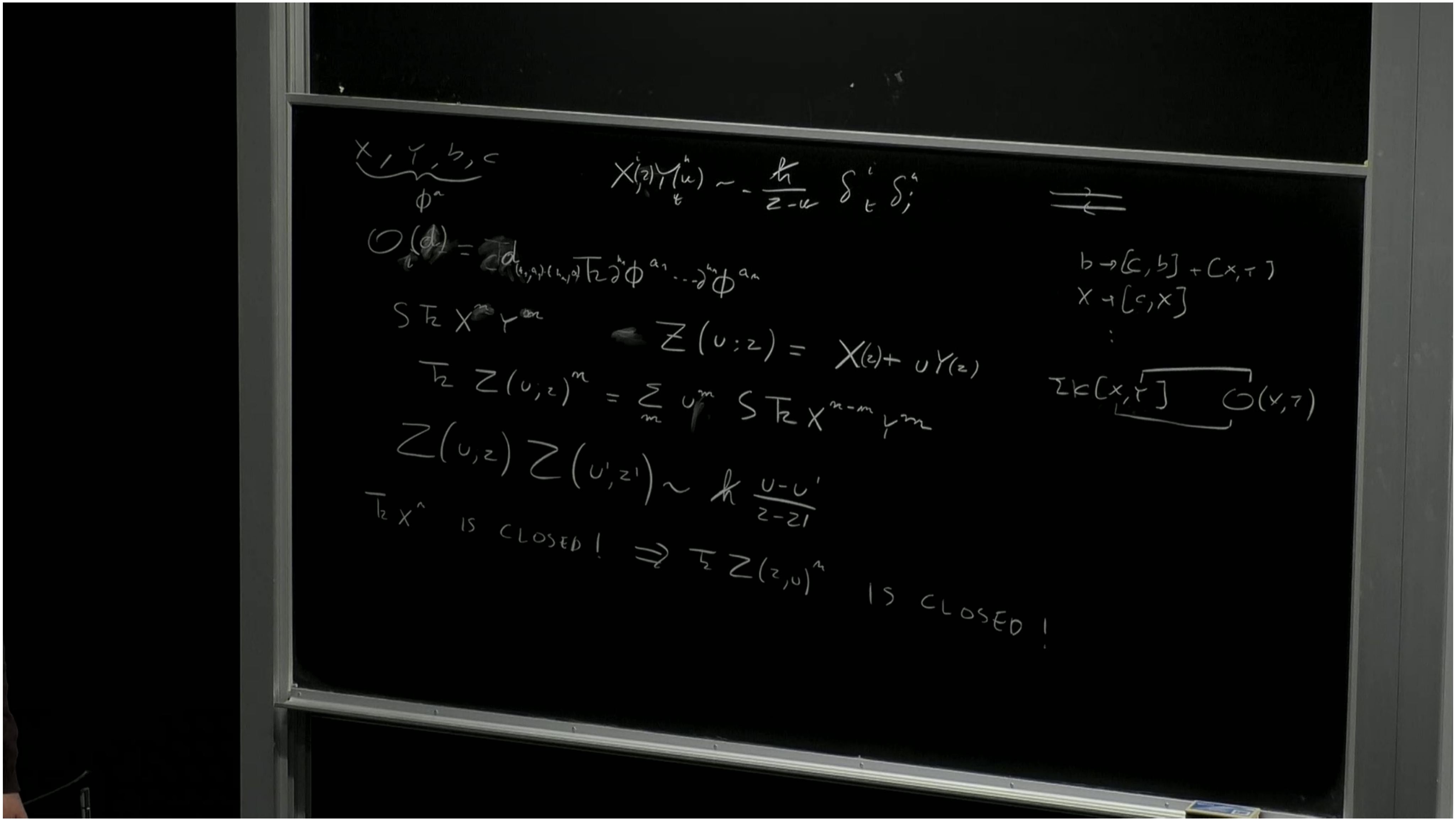
Title: Twisted Holography Mini-Course - Lecture 20231130

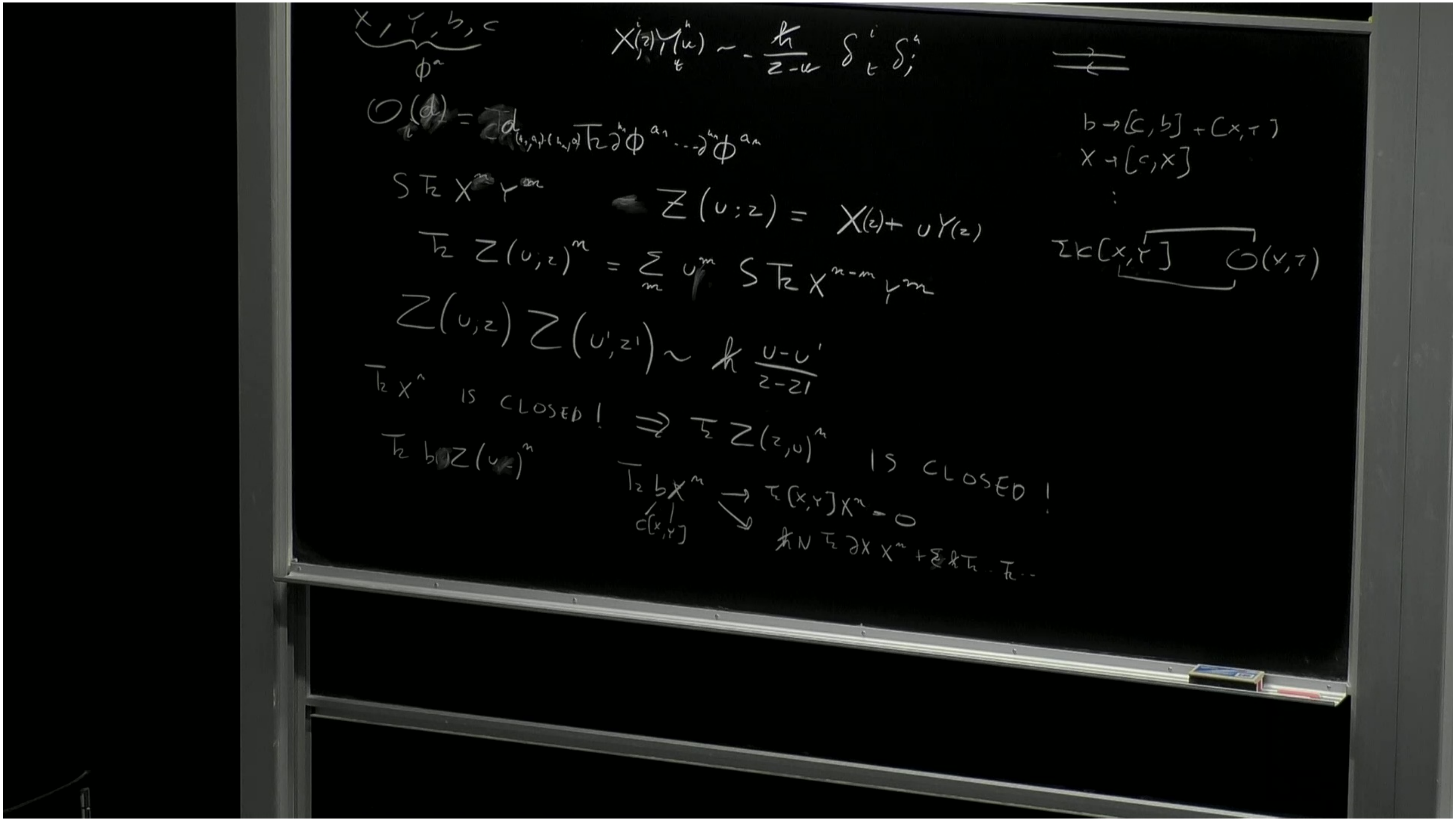
Speakers: Davide Gaiotto

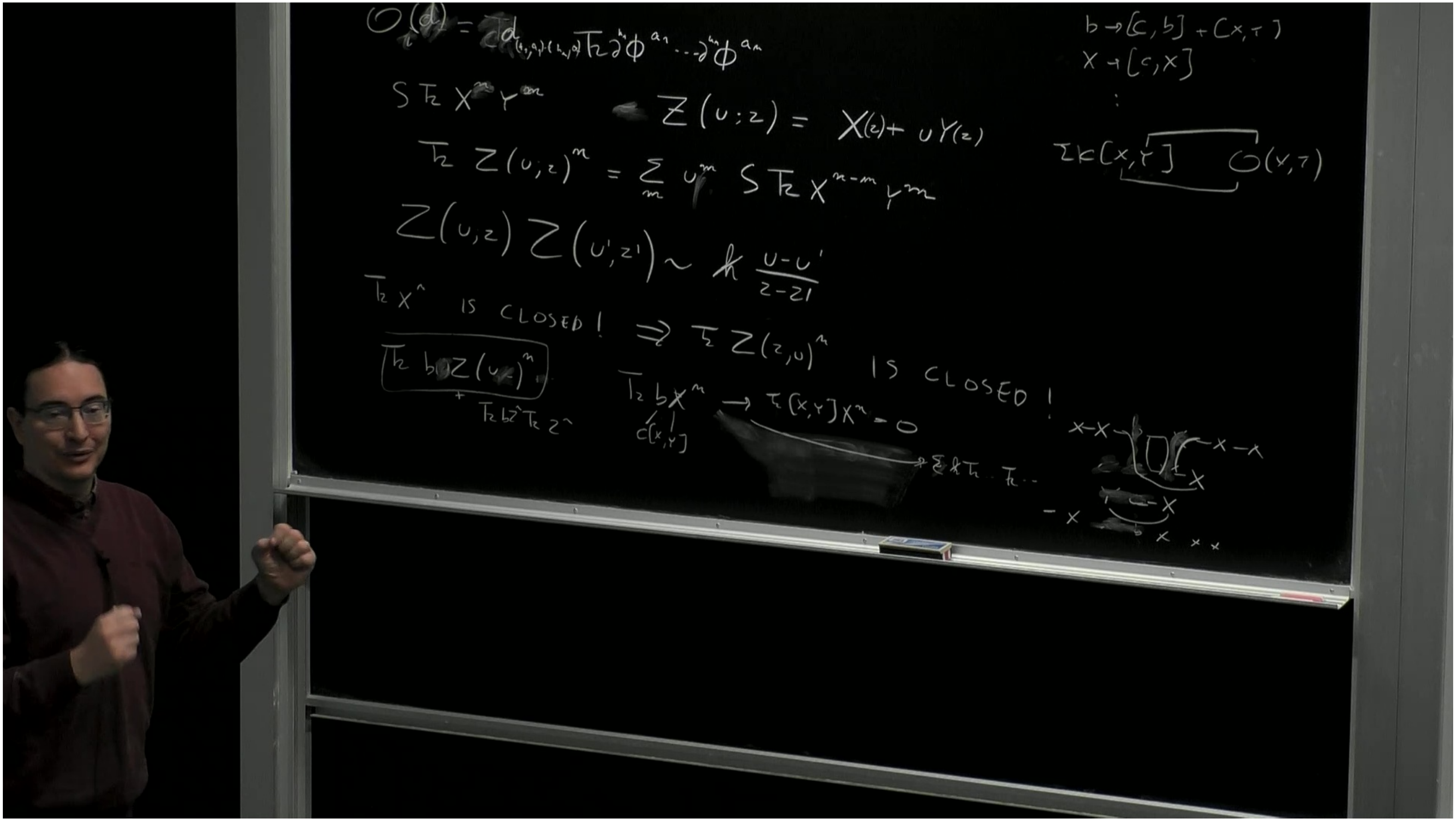
Collection: Twisted Holography Mini-Course

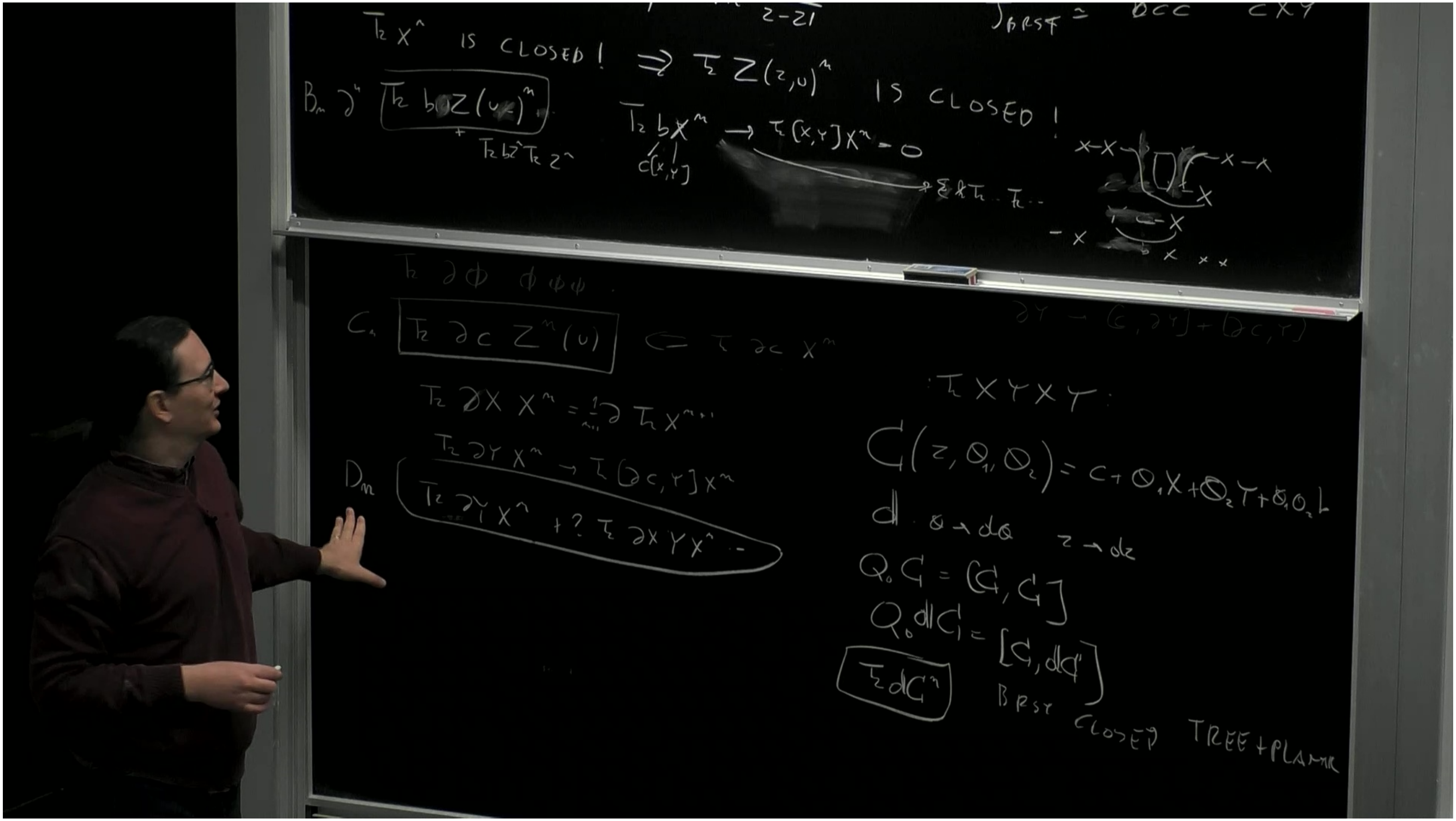
Date: November 30, 2023 - 9:00 AM

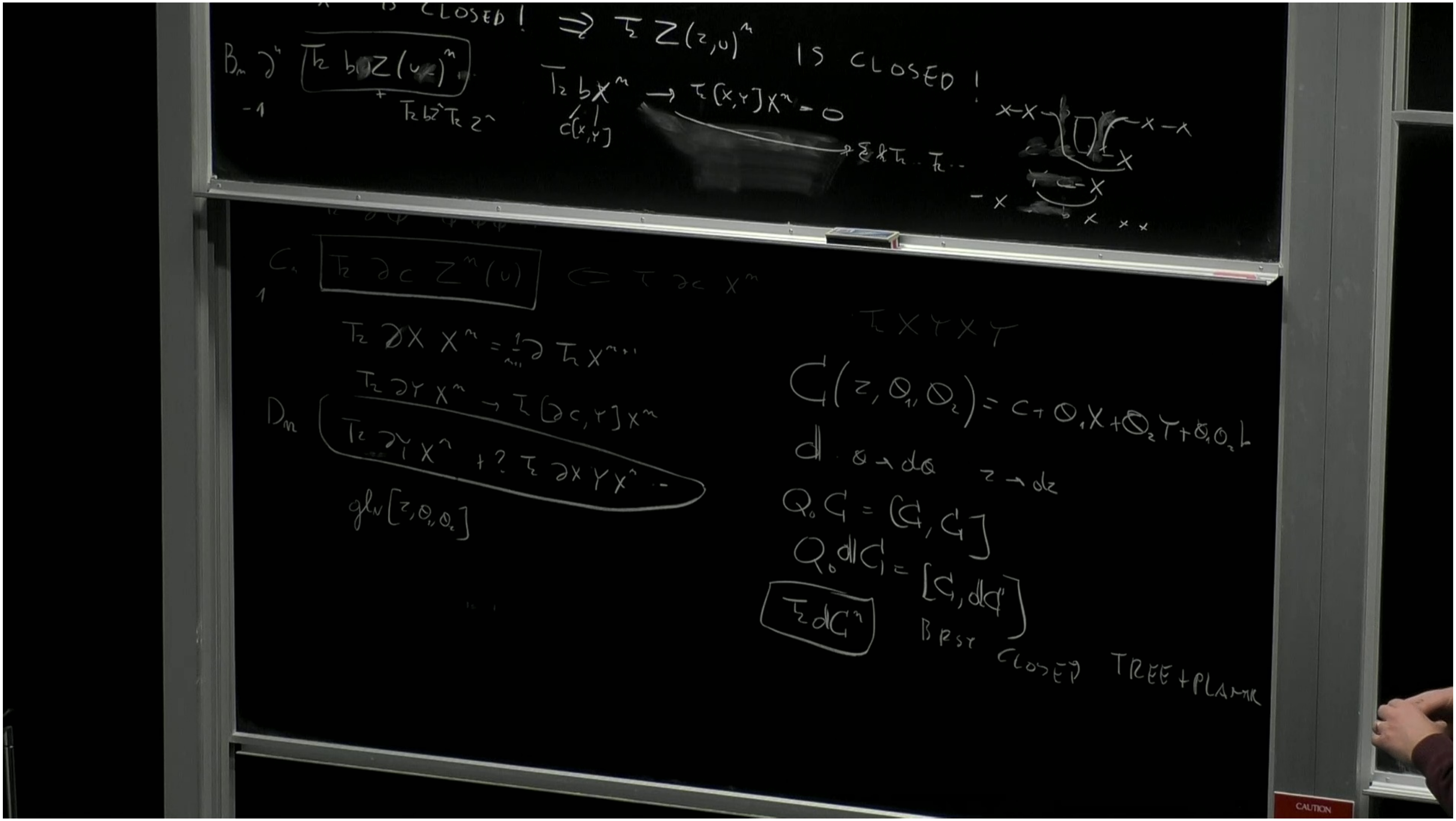
URL: https://pirsa.org/23110042

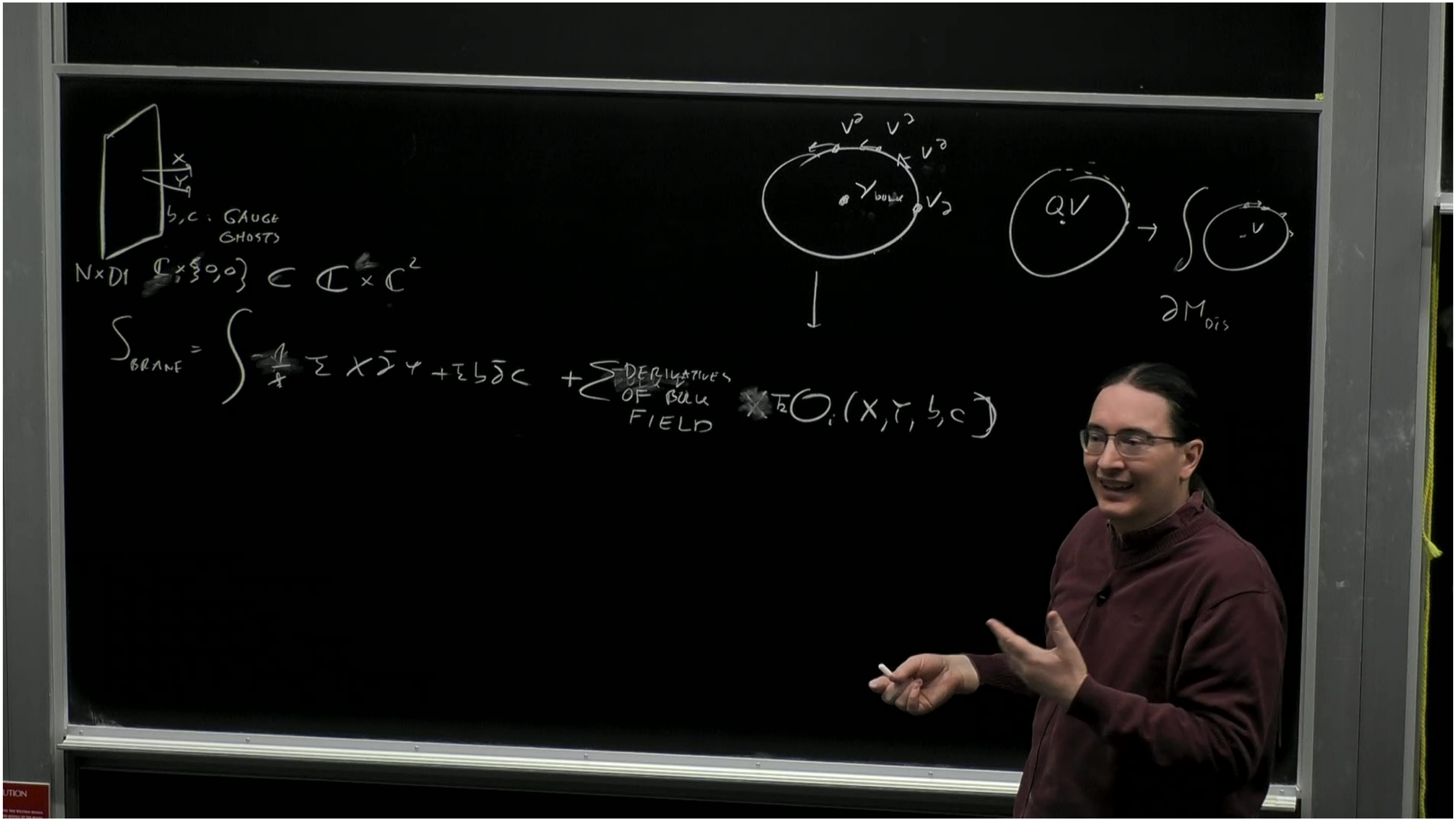

X, Y, b, c
Z(u;z) = X(z) + uY(z)
Tr X^n IS CLOSED ! ⇒ Tr Z(z,u)^n IS CLOSED !

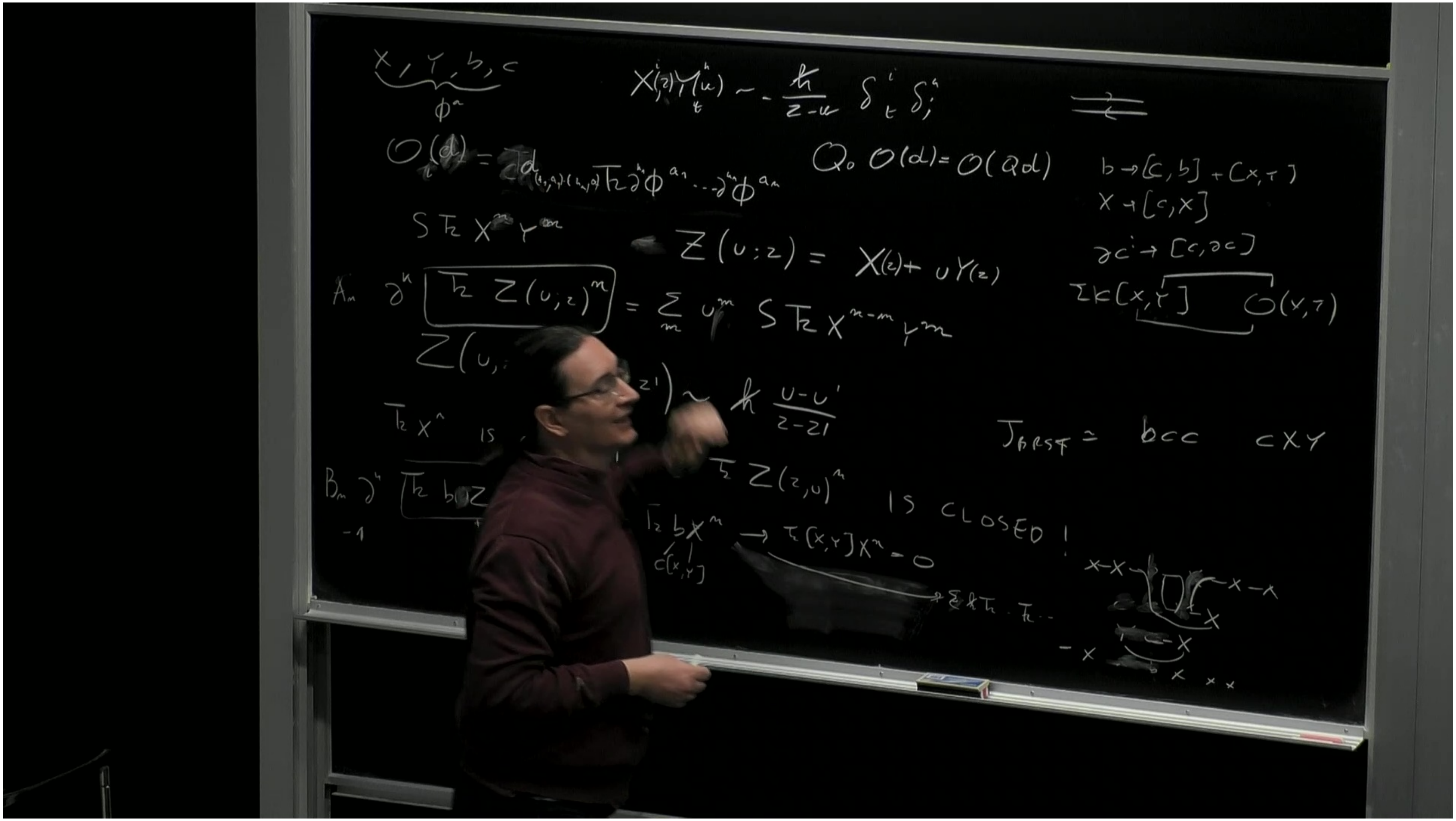

X , Y , b , c
S Tr X Y
Z (u : z) = X(z) + uY(z)
Tr Z(u; z) = Σ u S Tr X Y
Z(u, z) Z(u', z') ~ ħ (u − u')/(z − z')
Tr X IS CLOSED ! ⇒ Tr Z(z, u) IS CLOSED !
b → [c, b] + [X, Y]
X → [c, X]


Z (u ; z) = X(z) + u Y(z)
IS CLOSED !
IS CLOSED !

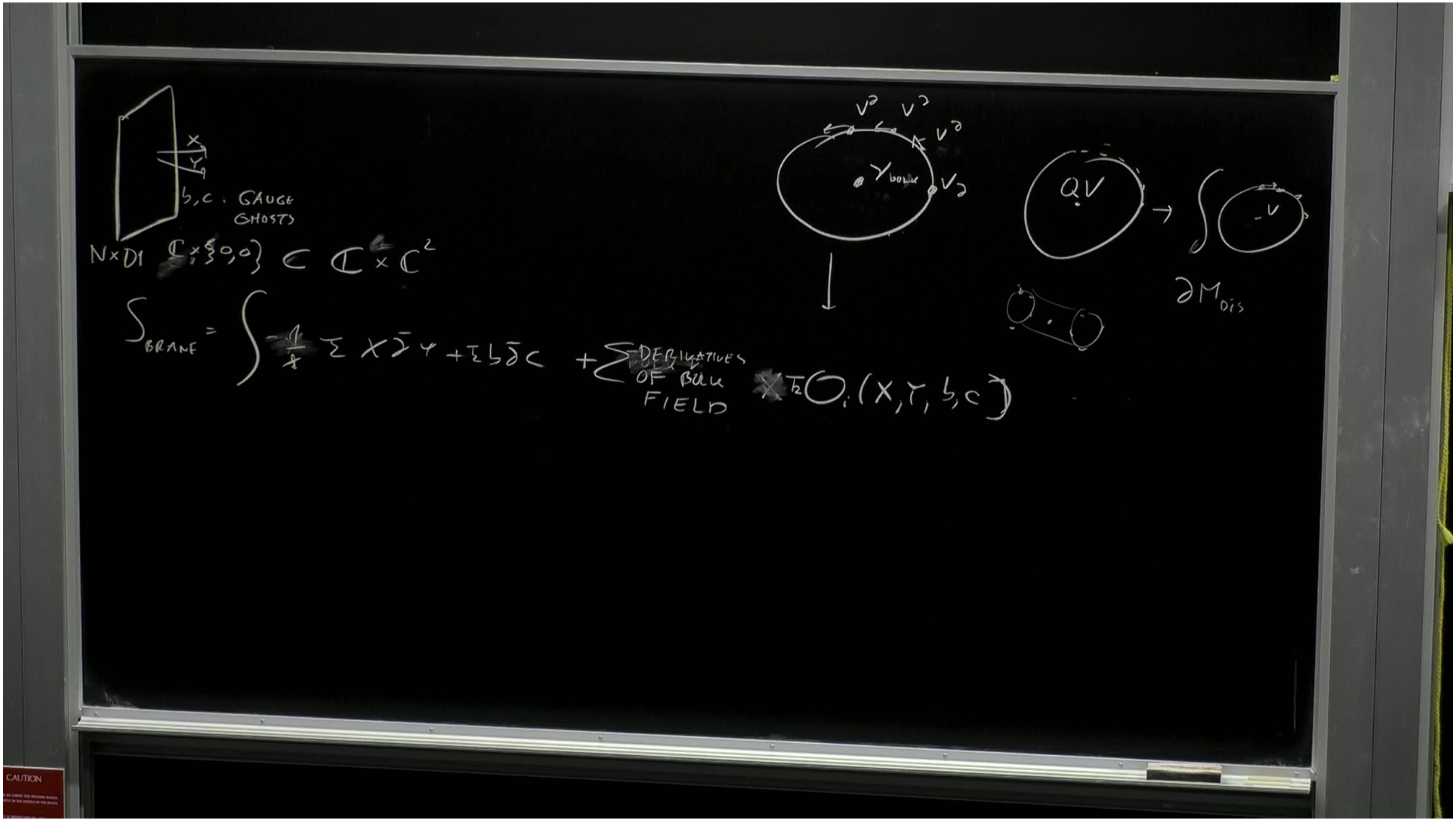

IS CLOSED!
IS CLOSED!
BRST
CLOSED
TREE + PLANAR

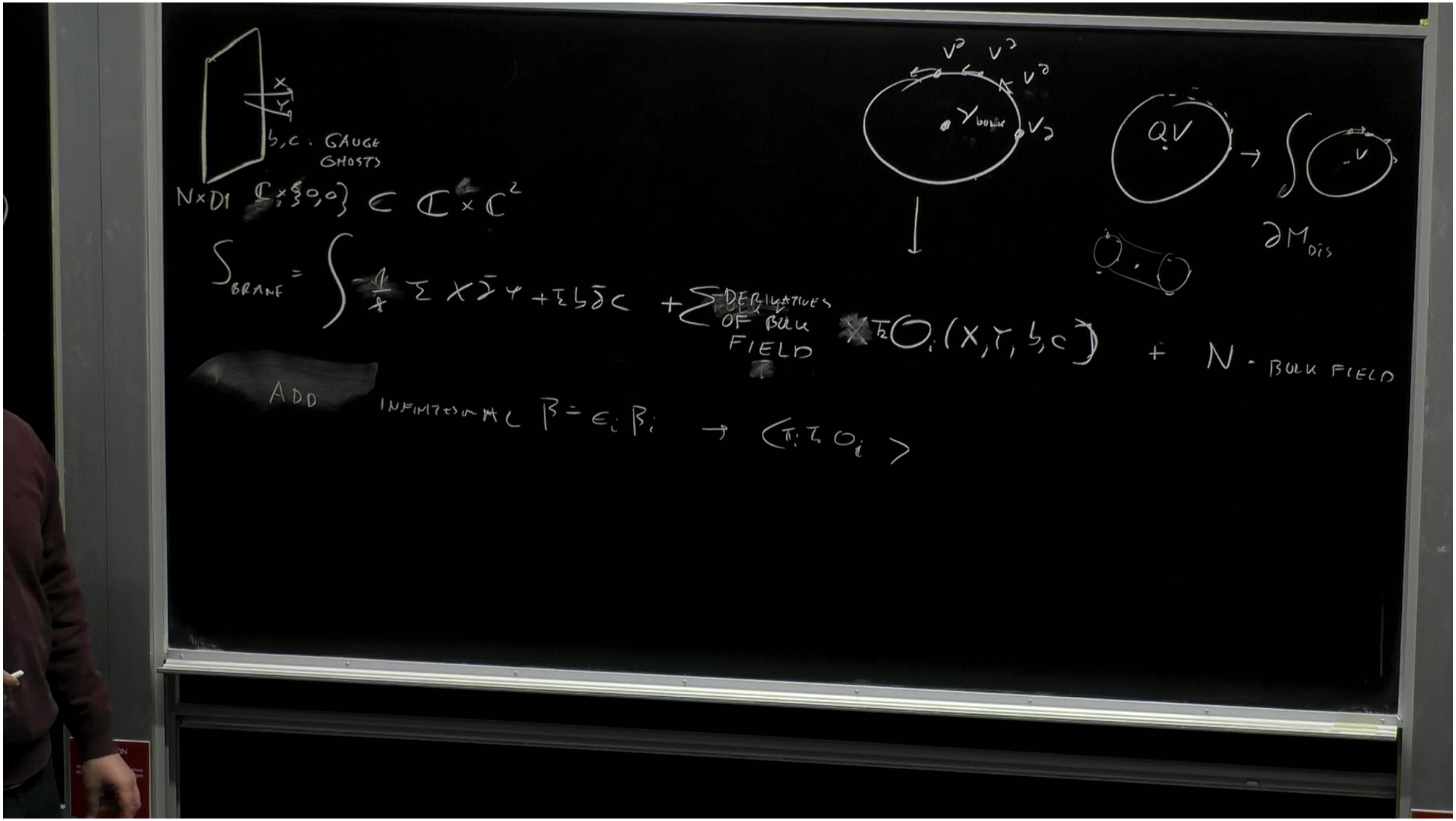

IS CLOSED! ⇒ Tr Z(z,u)^n IS CLOSED!
Tr b X^n → Tr [X,Y] X^n = 0
Tr ∂X X^n = 1/(n+1) ∂ Tr X^{n+1}
Tr ∂Y X^n → Tr [∂c, Y] X^n
gl_N[z, θ1, θ2]
C(z, θ1, θ2) = c + θ1 X + θ2 Y + θ1 θ2 b
Q0 C = [C, C]
Tr dC^n
BRST CLOSED TREE + PLANAR

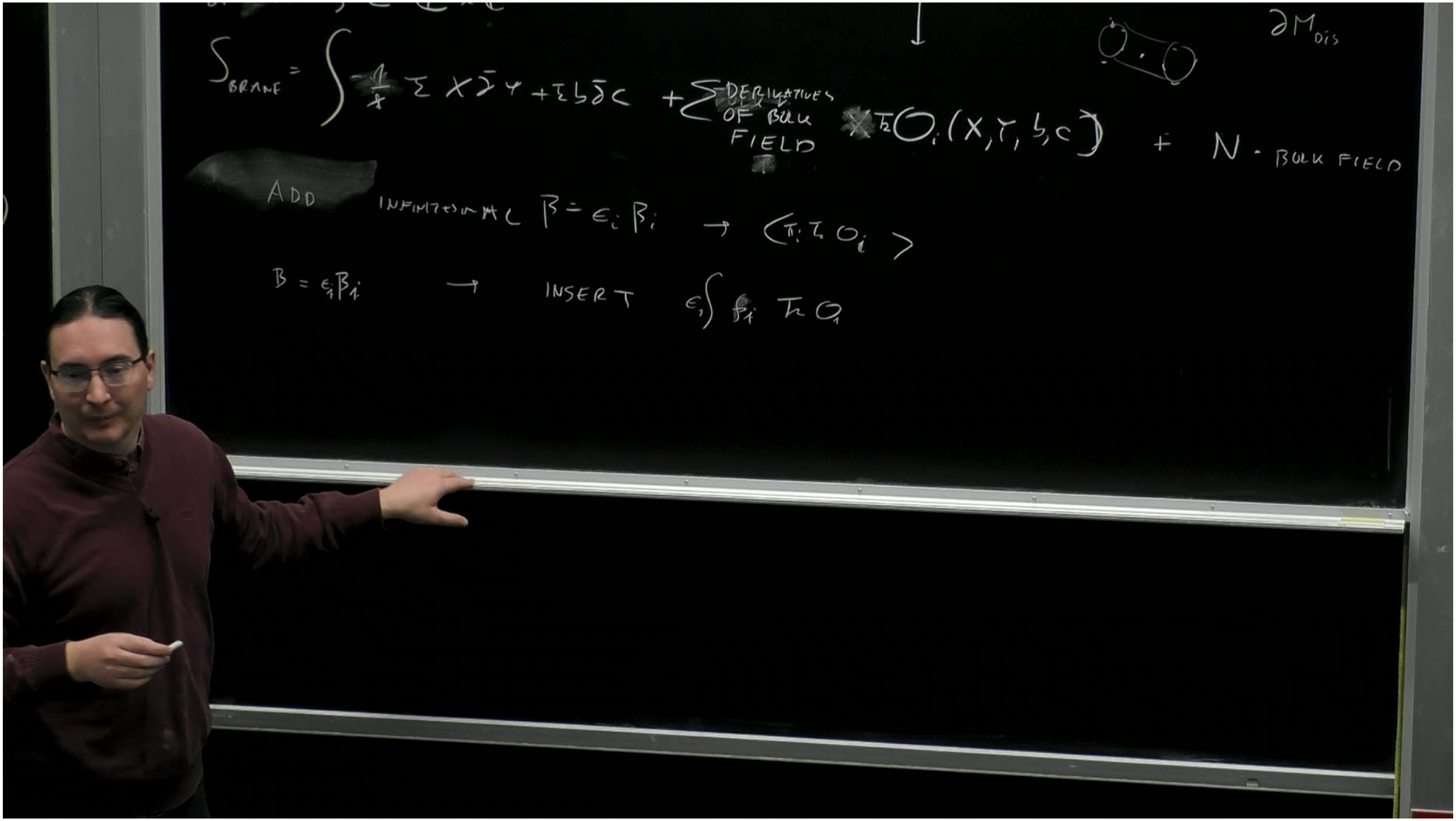

b,c : GAUGE GHOSTS
N×D1
QV
∂M_DIS
S_BRANE =
DERIVATIVES OF BULK FIELD



X, Y, b, c
Q₀ O(d) = O(Qd)
Z(u; z) = X(z) + uY(z)
IS CLOSED !


b,c : GAUGE
GHOSTS
N×D1
S BRANE =
DERIVATIVES
OF BULK
FIELD
Y bulk
QV
∂M Dis
CAUTION


b,c : GAUGE GHOSTS
N×D1
DERIVATIVES
OF BULK
FIELD
N · BULK FIELD
ADD
INFINITESIMAL
QV
∂M


∂M DIS
S BRANE = ∫ -1/4 Σ X∂̄ψ + Σ b∂̄c + Σ DERIVATIVES OF BULK FIELD Tr O_i (X, ψ, b, c) + N · BULK FIELD
ADD INFINITESIMAL β = ε_i β_i → ⟨Π_i Tr O_i⟩
B = ε_1 β_1 → INSERT ε_1 ∫ β_1 Tr O_1

$\mathbb{C}_z \times \mathbb{C}^2_{a,b}$

$$\beta = \beta^{\mathbb{C}^2} \otimes \delta^{(2)}(z-w)\, d\bar{z} \Rightarrow \int_{\hbar} p(X,Y)(w)$$

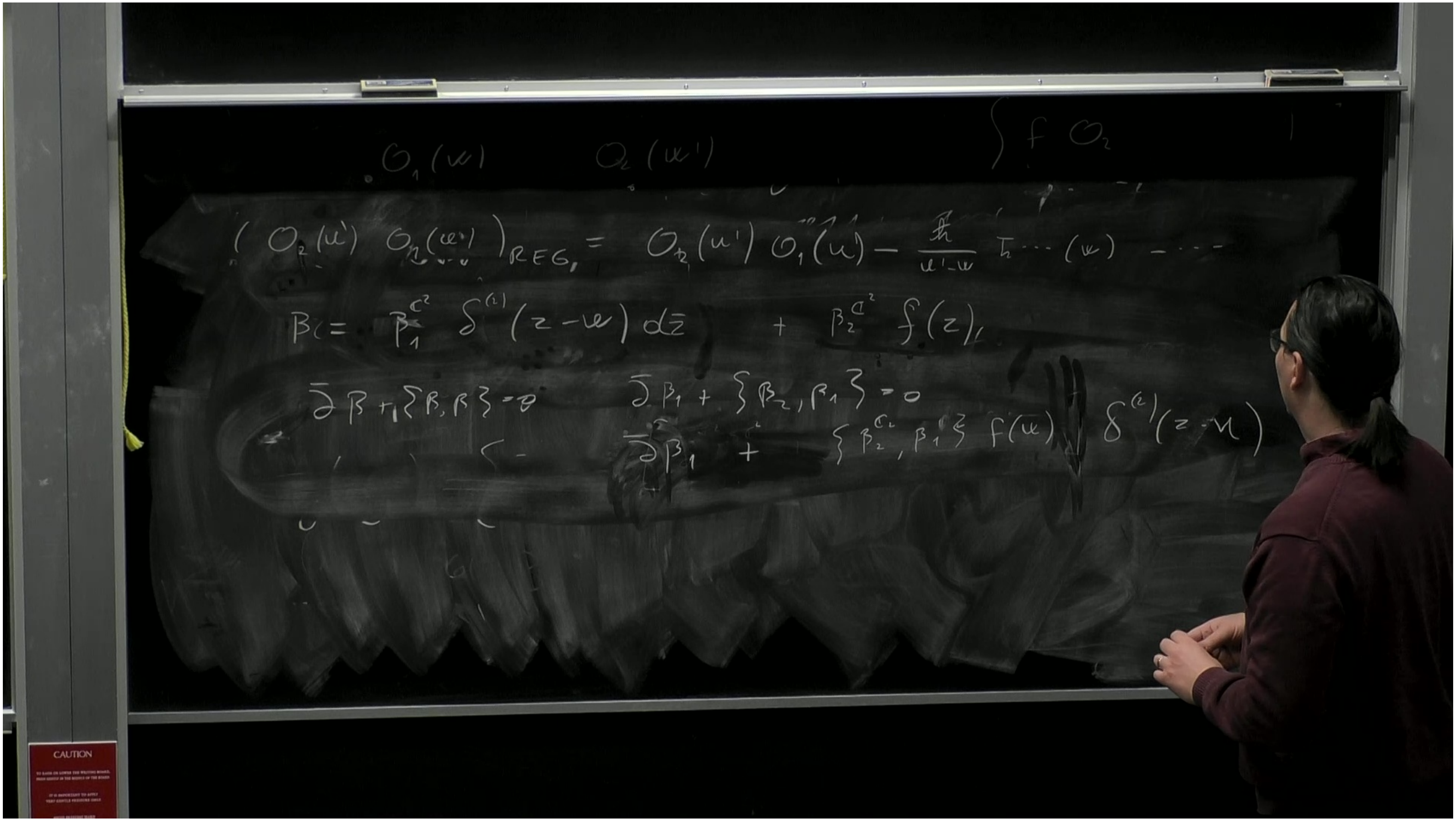
$$\partial^{\mathbb{C}^2}\beta^{\mathbb{C}^2} = 0 \qquad \beta^{\mathbb{C}^2} = \partial^{\mathbb{C}^2} p(a,b) = \partial_b p\, \partial_a - \partial_a p\, \partial_b$$

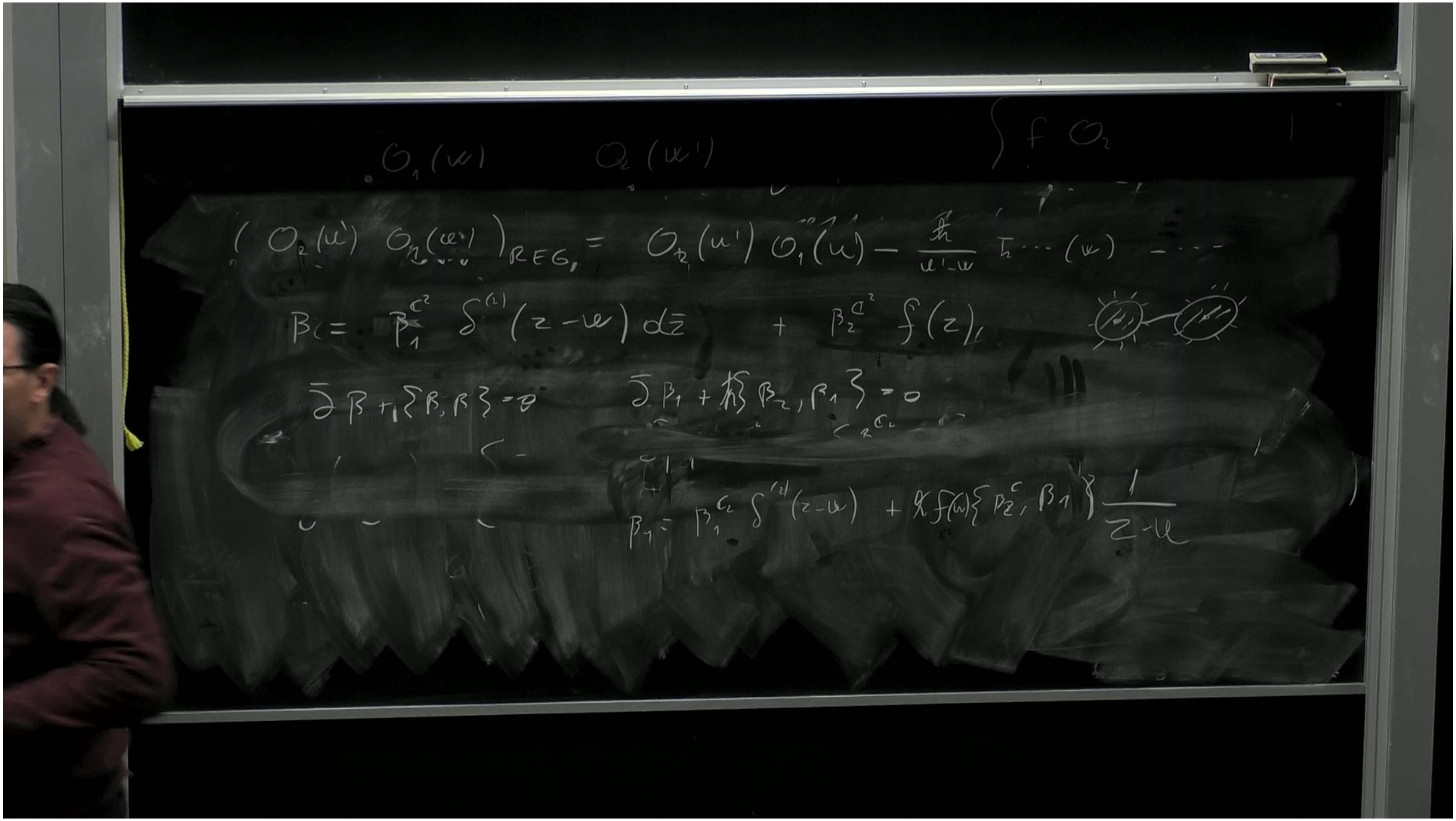
$$\beta^{\mathbb{C}^2} = p(a,b) \Rightarrow \int_{\hbar} b\, p(X,Y)$$

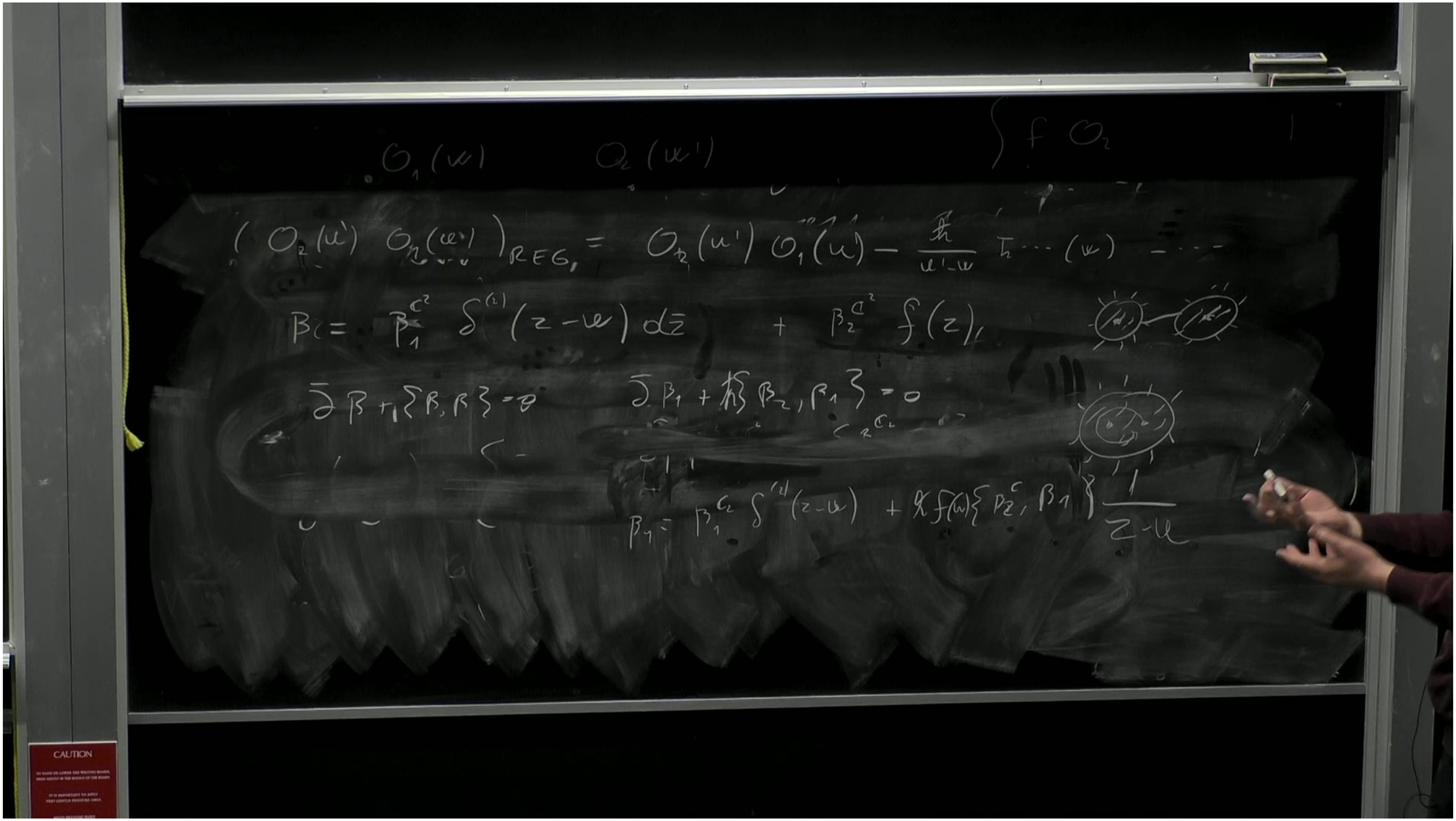
$$\beta = \partial\beta^{\mathbb{C}^2} \otimes \delta^{(2)}(z-w)\, d\bar{z}\, \partial_z + \beta^{\mathbb{C}^2} \otimes \partial_z \delta^{(2)}(z-w)\, d\bar{z}$$

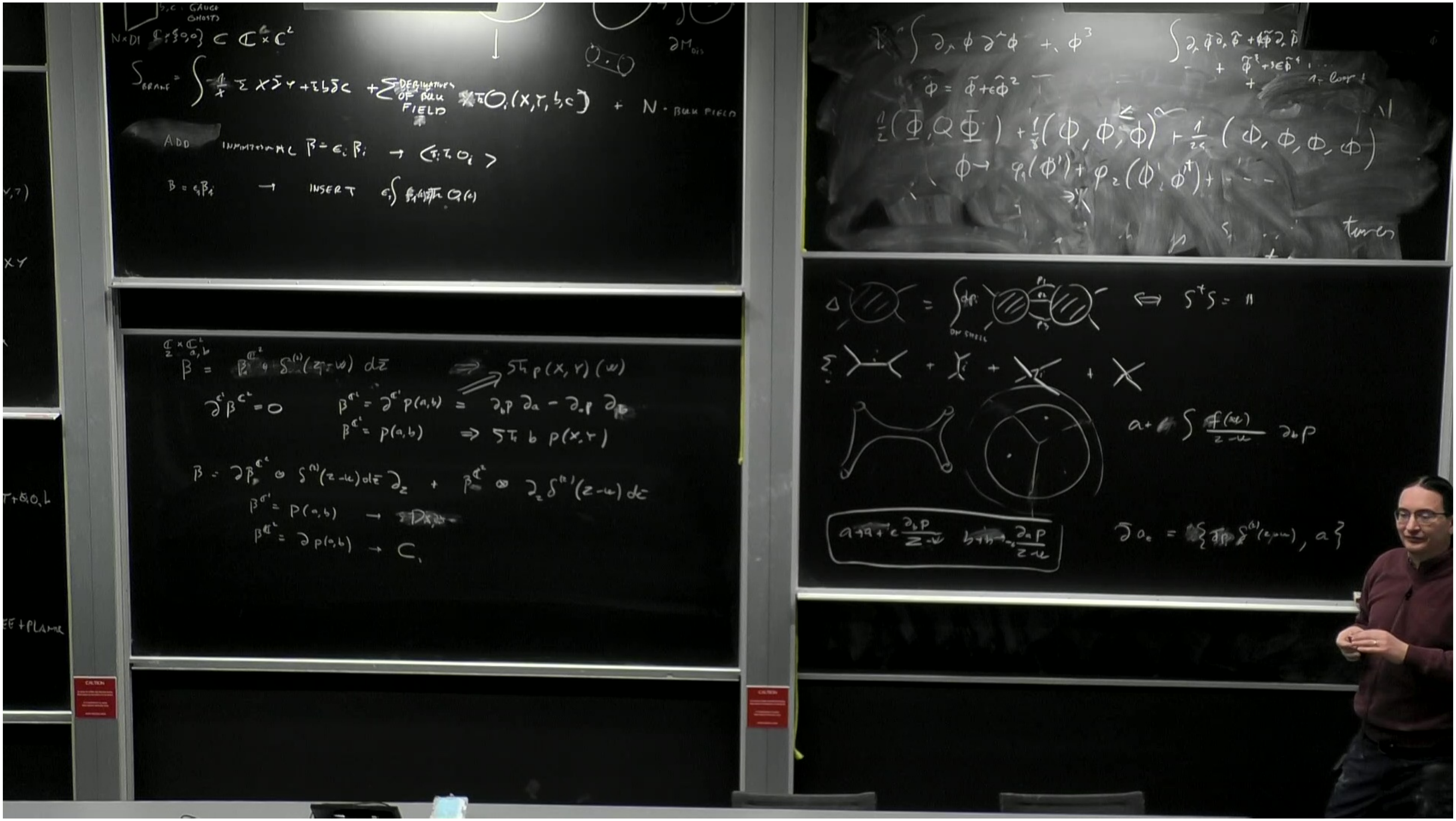
$$\beta^{\mathbb{C}^2} = p(a,b) \rightarrow \text{[illegible]}$$

$$\beta^{\mathbb{C}^2} = \partial p(a,b) \rightarrow C_1$$


O_1(w)   O_2(w')   ∫ f O_2
(O_2(w') O_1(w))_REG = O_2(w') O_1(w) − ħ/(w'−w) T ··· (w) − ···
β = β_1^{C^2} δ^{(2)}(z−w) dz̄ + β_2^{C^2} f(z)
∂̄β + ½{β, β} = 0   ∂̄β_1 + {β_2, β_1} = 0
∂̄β_1 + {β_2^{C_2}, β_1} f(w) δ^{(2)}(z−w)


O1(w)   O2(w')
(O2(w') O1(w))REG = O2(w') O1(w) − ħ/(w'−w) ...
β = β1 δ(z−w) dz̄ + β2 f(z)
∂̄β + {β, β} = 0   ∂̄β1 + ħ{β2, β1} = 0
β1 = β1 δ(z−w) + ħ f(w){β2, β1} 1/(z−w)


O₁(w)   O₂(w')
∫ f O₂
(O₂(w') O₁(w))REG₁ = O₂(w') O₁(w) − ħ/(w'−w) T₂ ⋯ (w)
β = β₁^{c²} δ^{(2)}(z−w) dz̄ + β₂^{c²} f(z)
∂̄β + ½{β, β} = 0
∂̄β₁ + ħ{β₂, β₁} = 0
β₁ = β₁^{c₂} δ^{(2)}(z−w) + ħ f(w){β₂^{c}, β₁} 1/(z−w)
CAUTION


GAUGE GHOSTS
DERIVATIVES OF BULK FIELD
N · BULK FIELD
ADD
INSERT
ON SHELL
tree