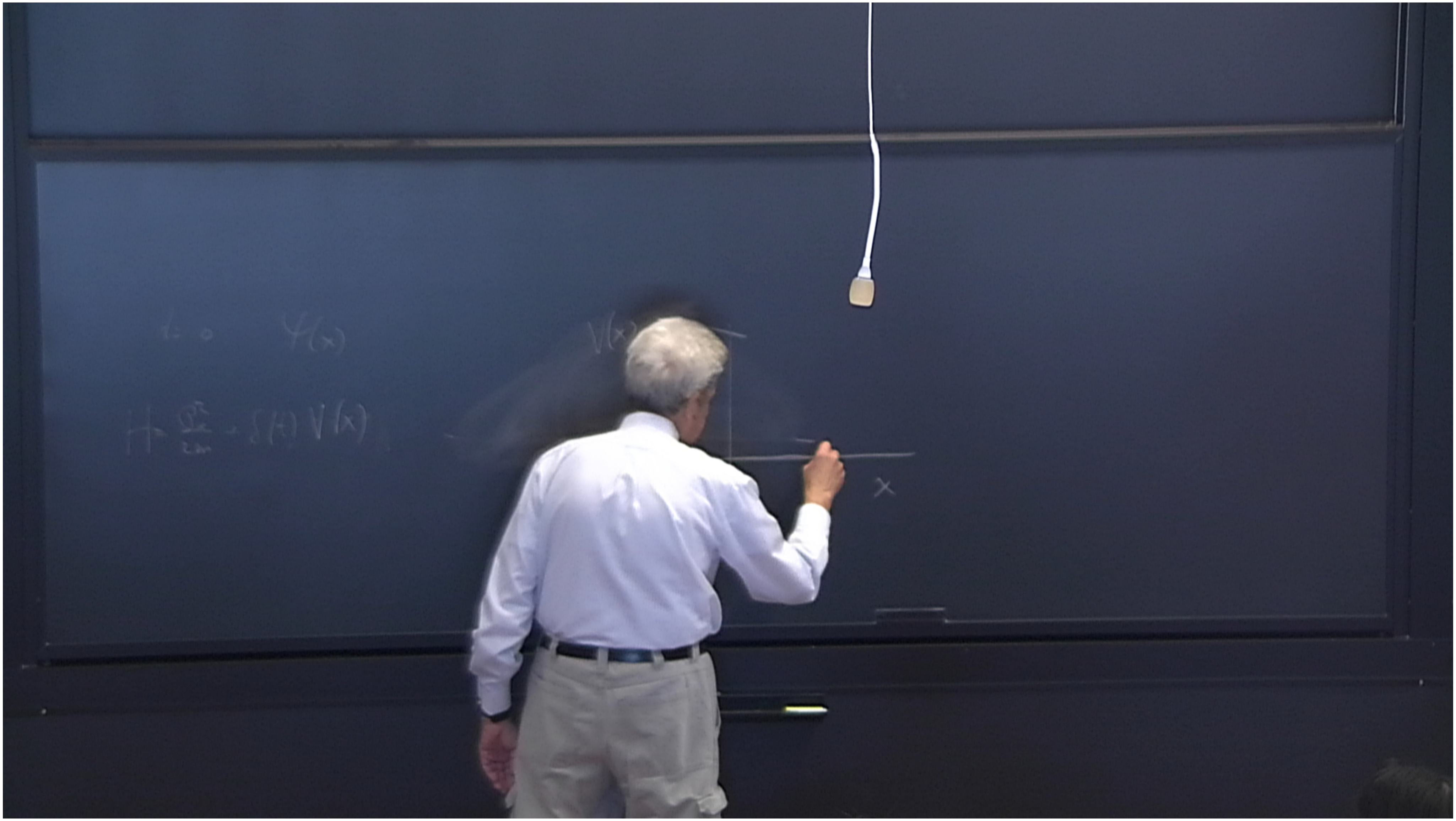
Title: TBA

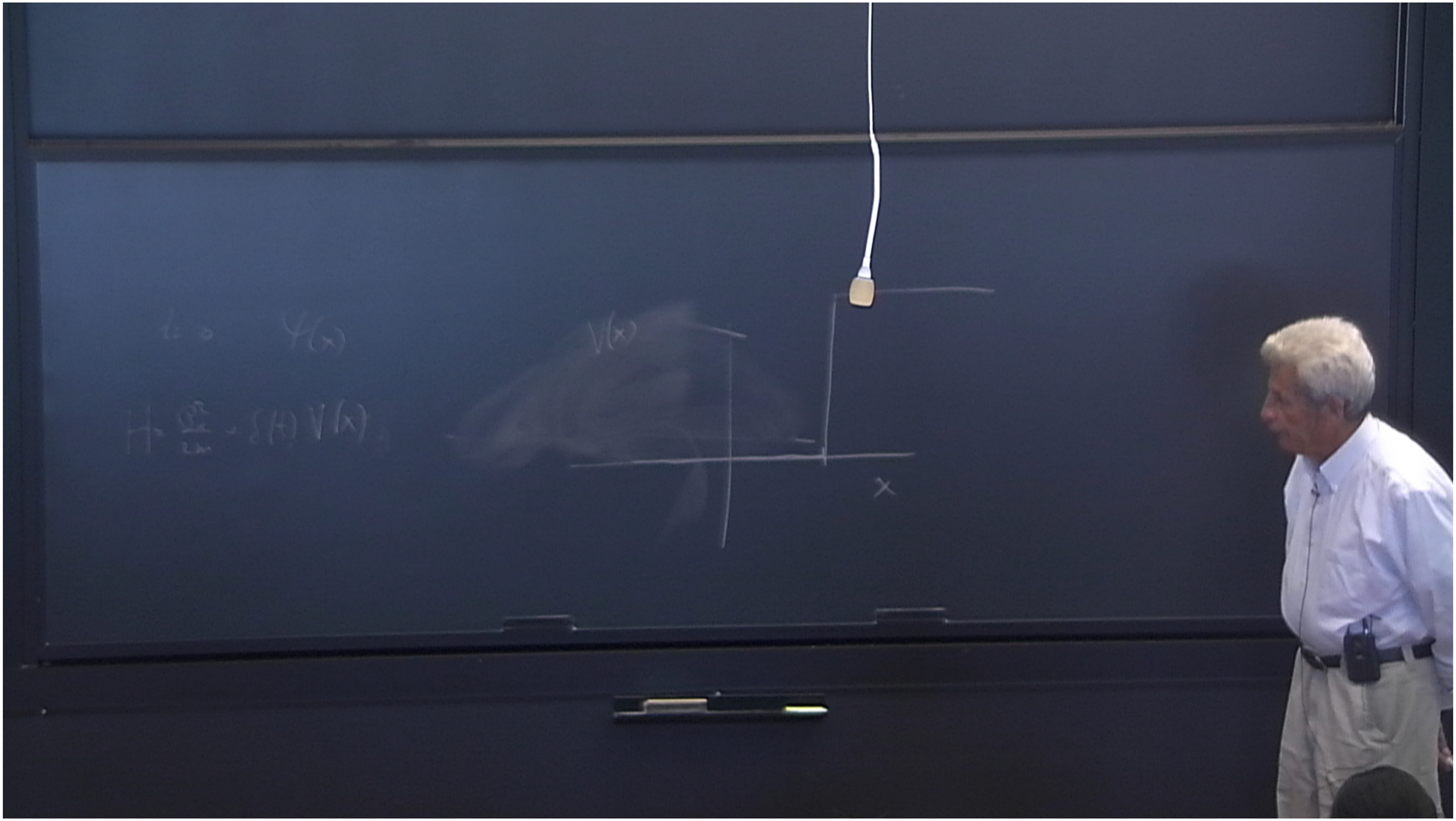
Date: Jun 10, 2016 10:00 AM

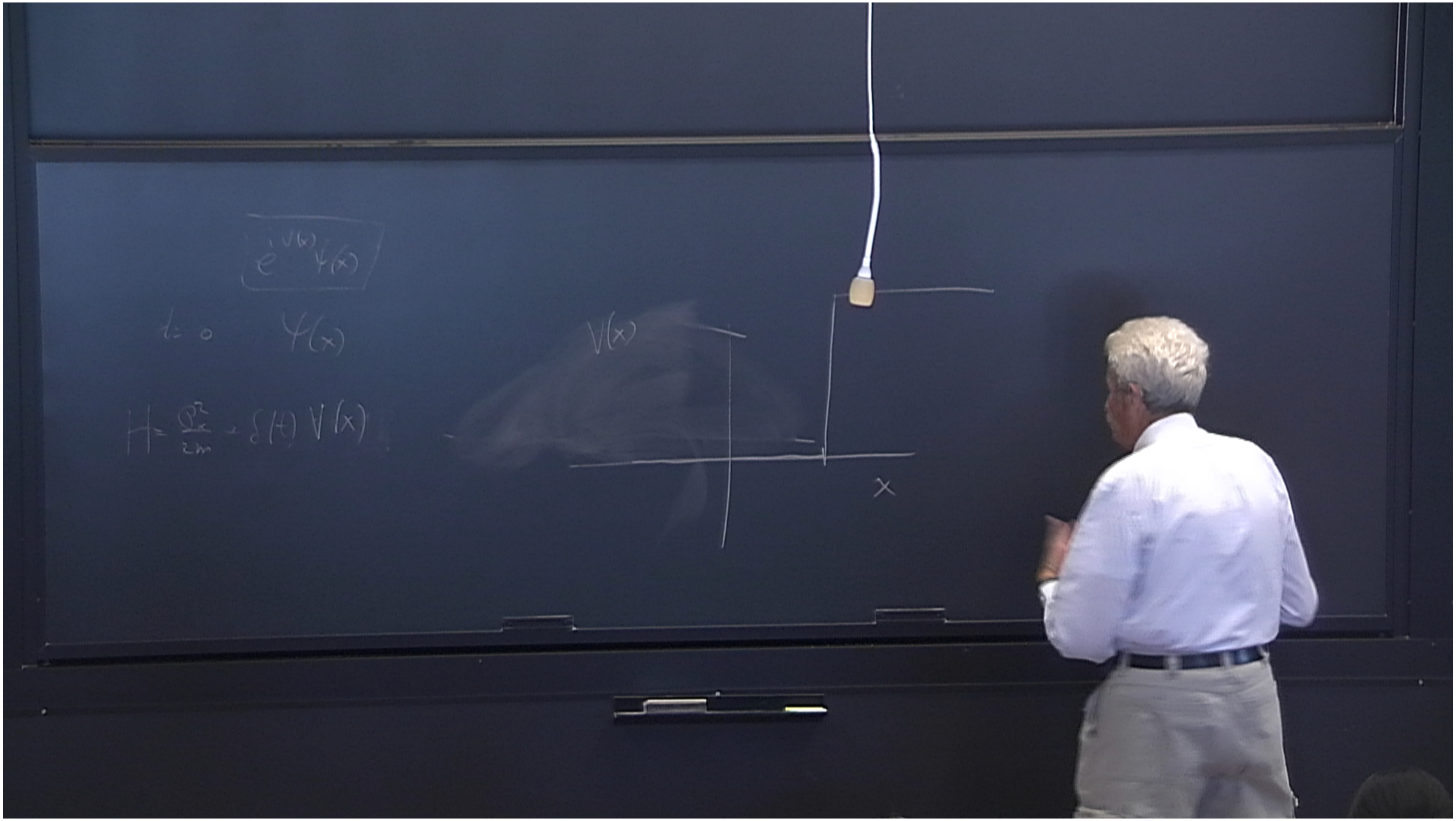
URL: http://pirsa.org/16060083

Abstract:

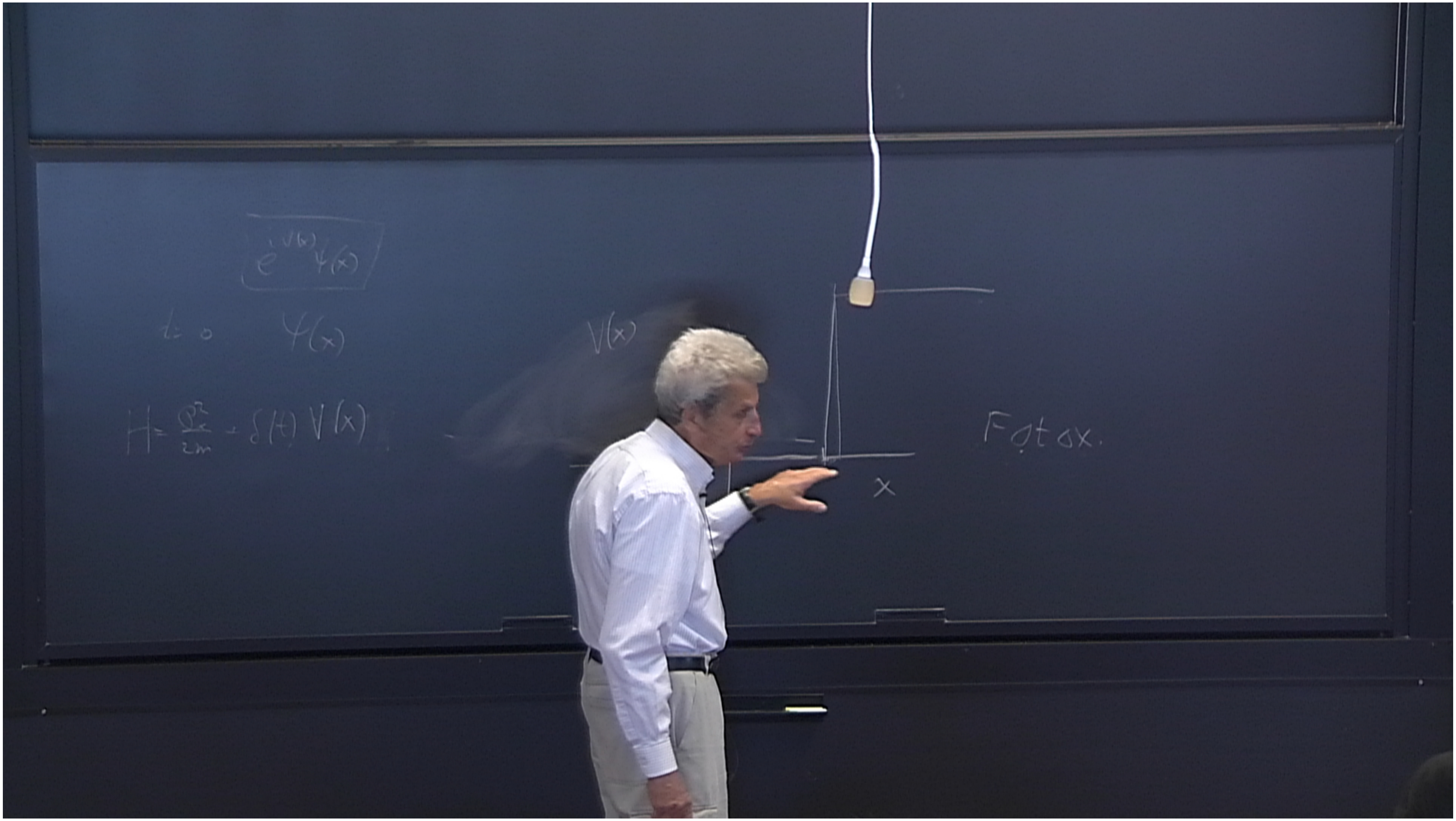


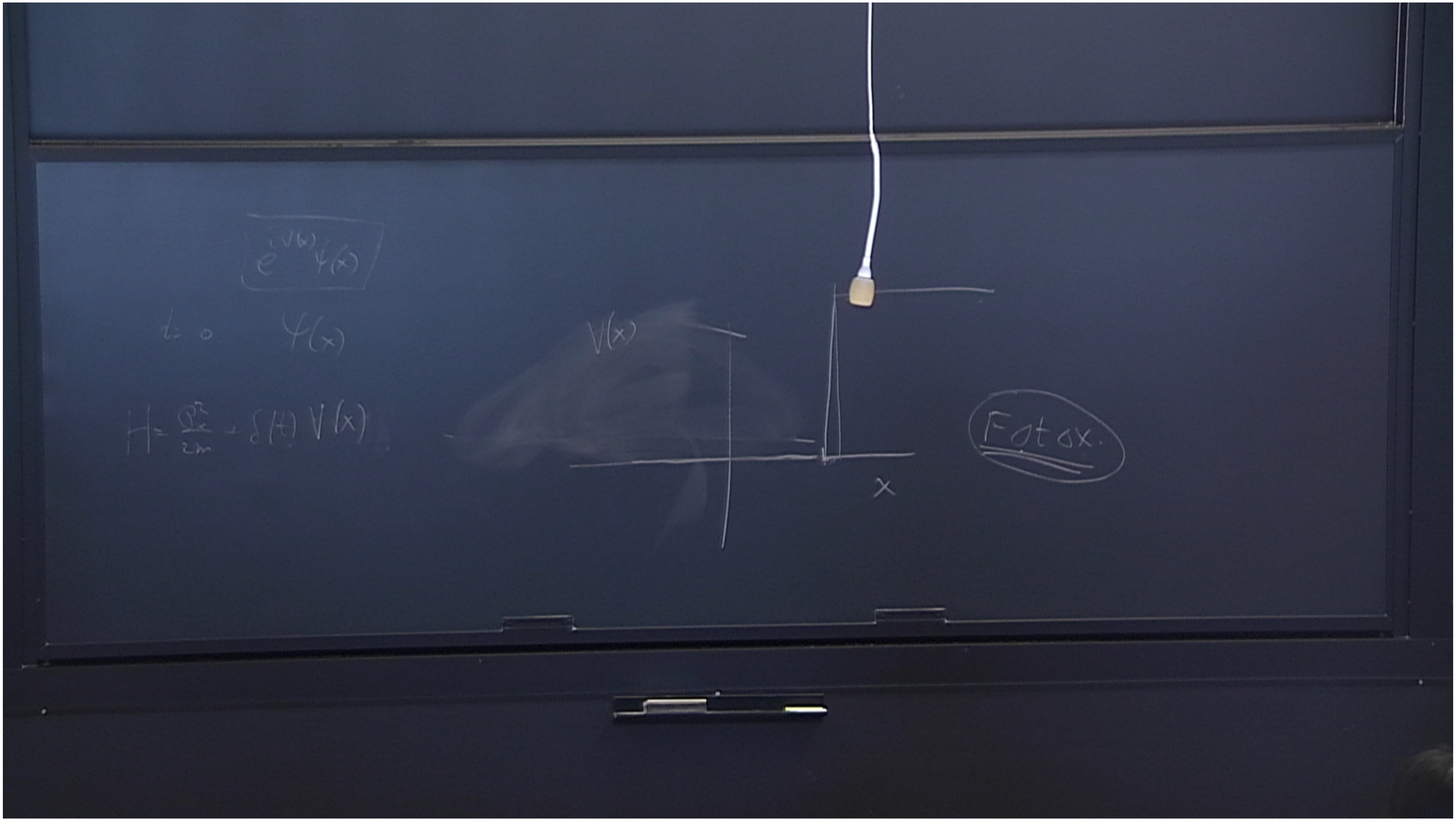
t = 0   ψ(x)
H = P²/2m + λ(t) V(x)
V(x)
x

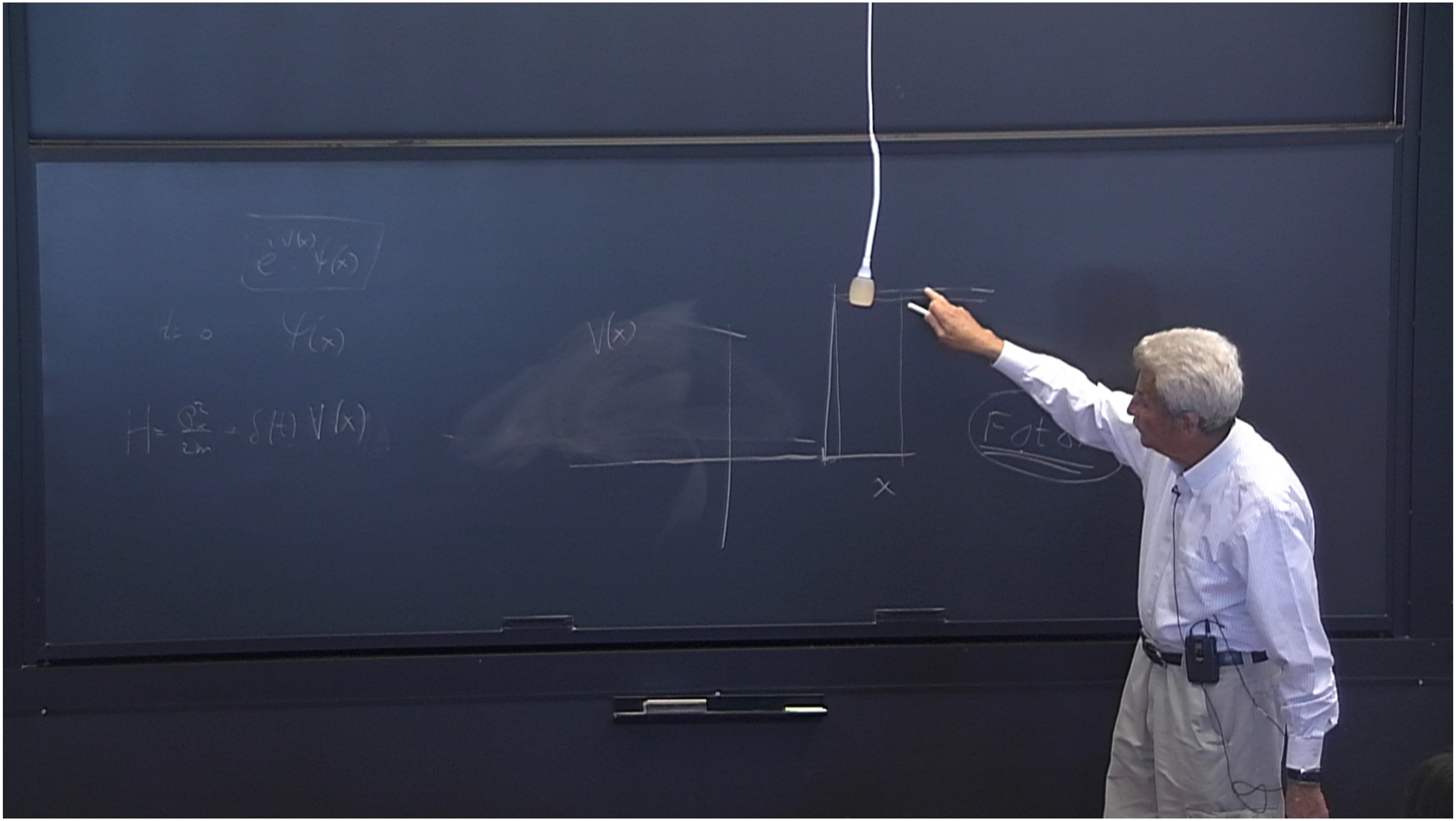

t = 0
ψ(x)
V(x)
x



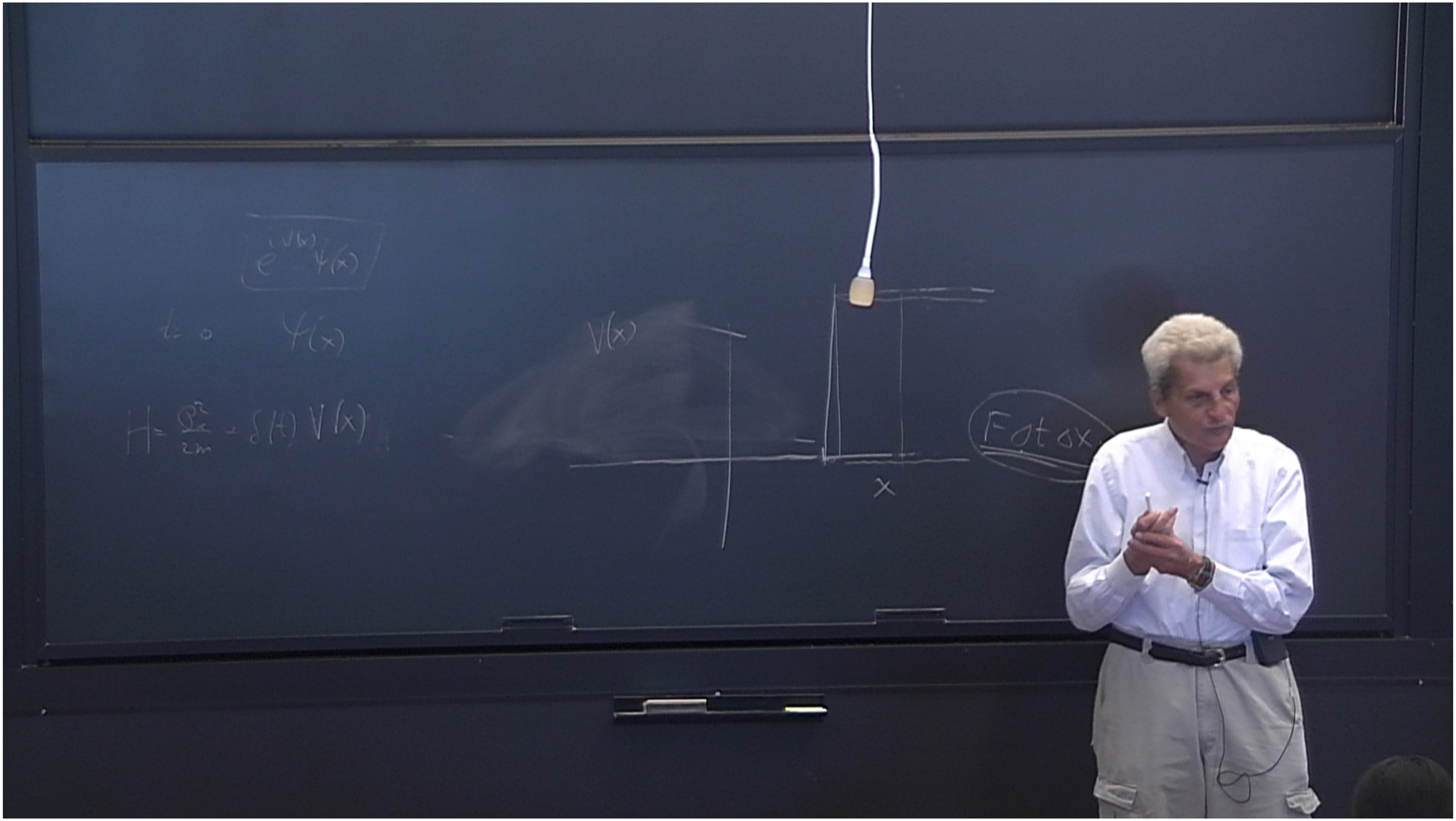
$e^{iV(x)}\psi(x)$
$t=0 \quad \psi(x)$
$H=\frac{p_x^2}{2m}+\delta(t)V(x)$
V(x)
x

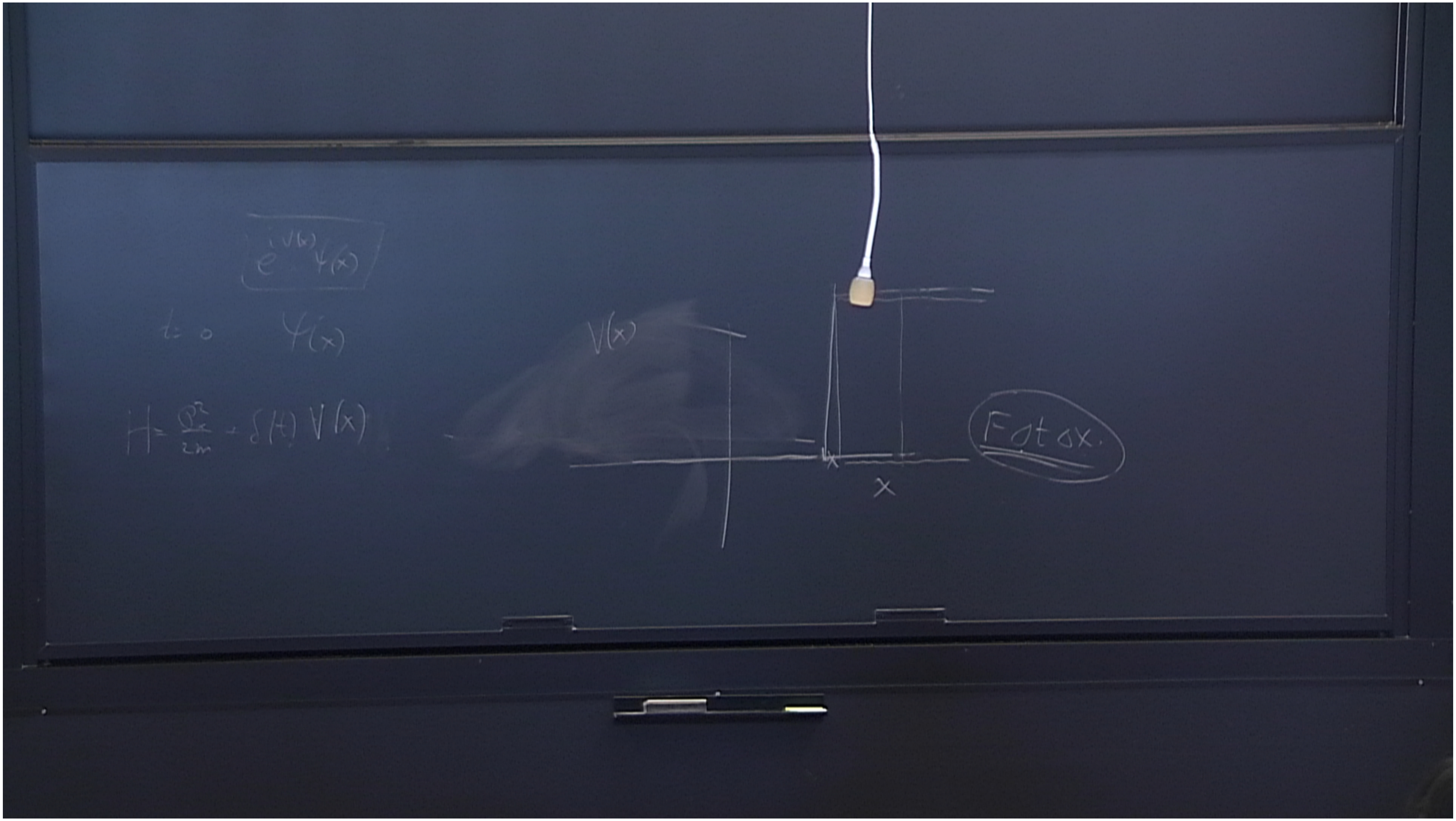

t = 0
ψ(x)
V(x)
x

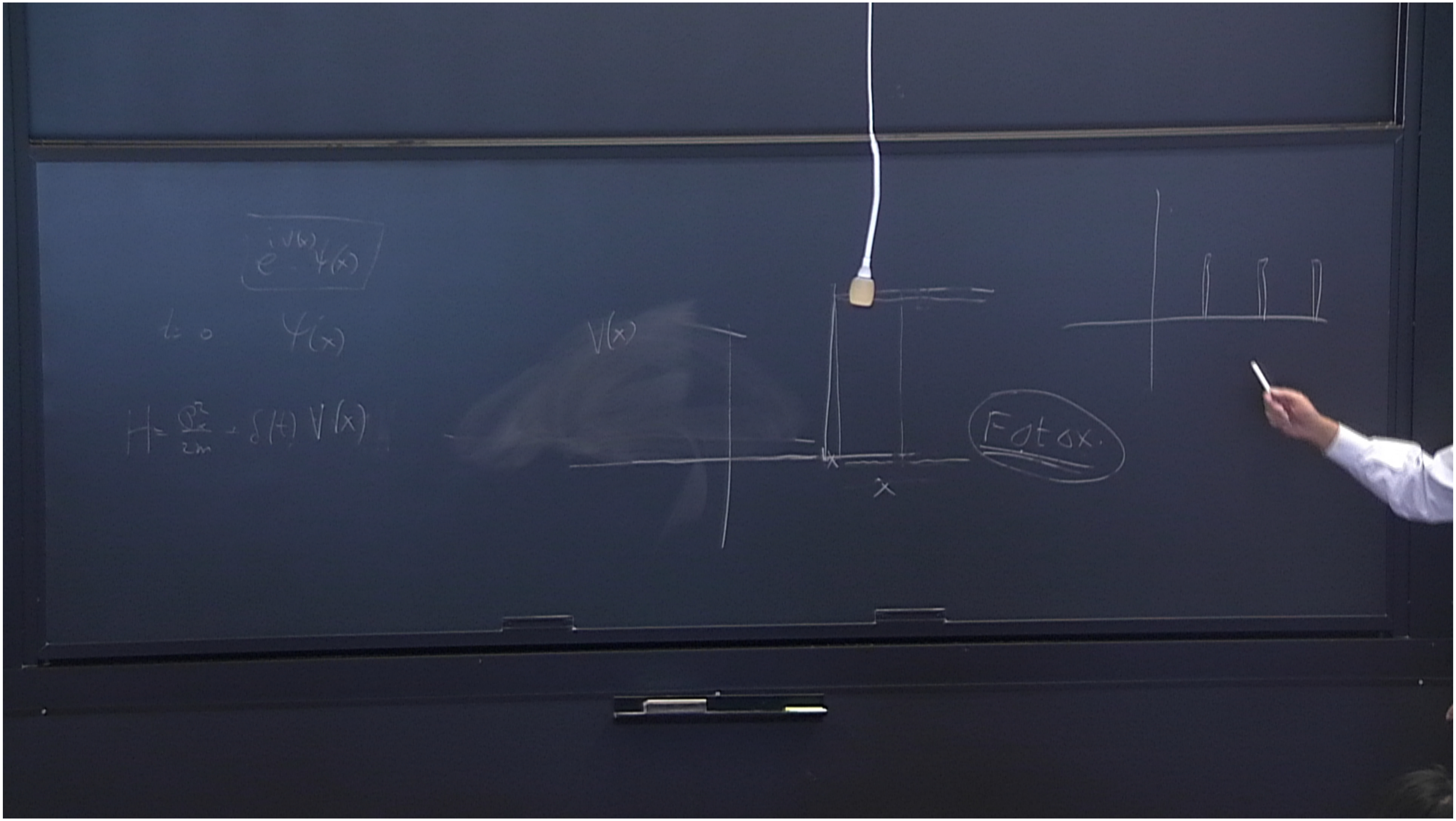

e^{iV(x)} ψ(x)
t = 0
ψ(x)
H = p_x^2/2m + δ(t) V(x)
V(x)
x



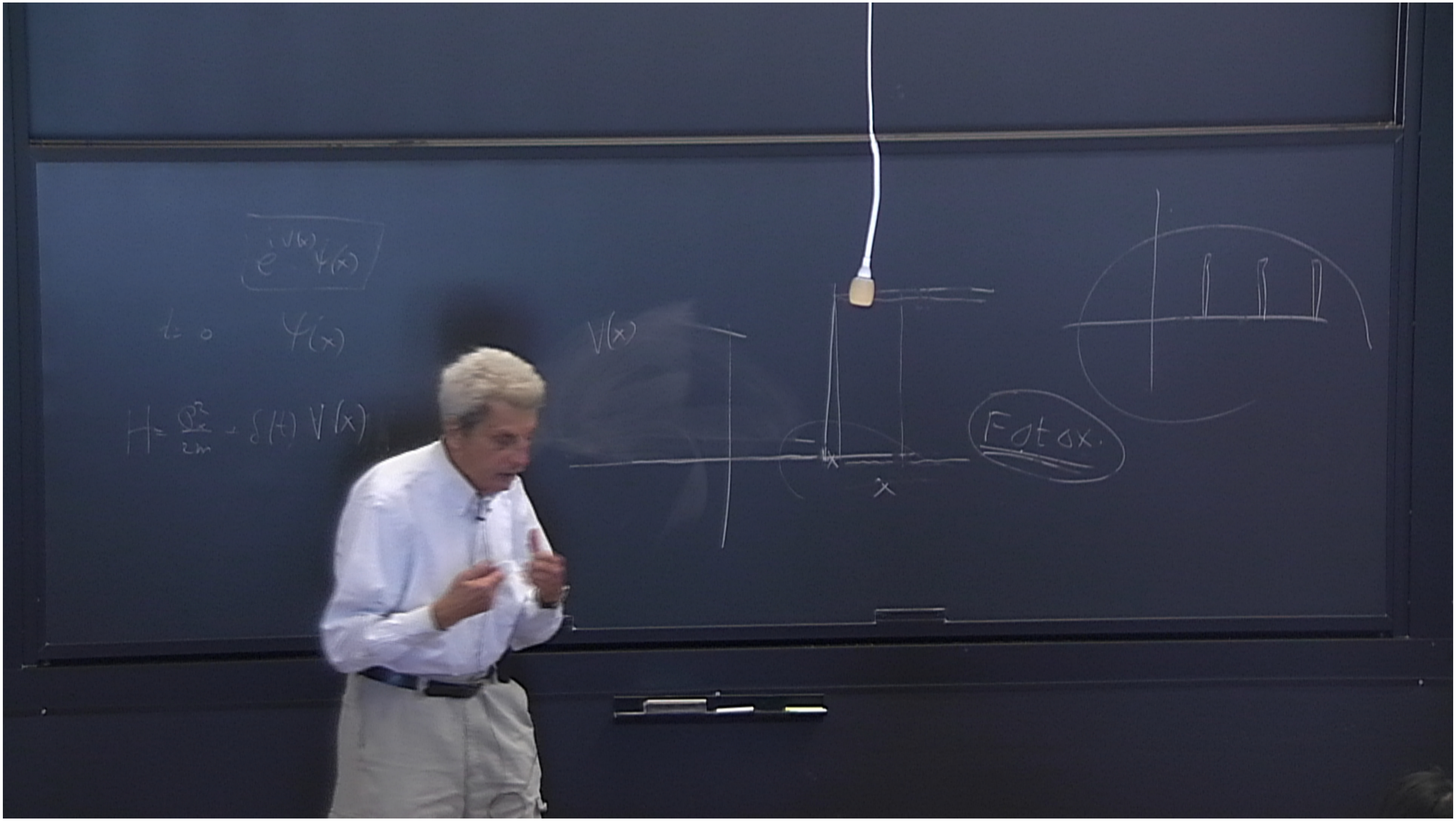
$e^{iV(x)}\psi(x)$
$t=0$ $\psi(x)$
$H=\frac{p_x^2}{2m}+\delta(t)V(x)$
V(x)
x


$e^{iV(x)}\psi(x)$
$t=0 \quad \psi(x)$
$H=\frac{p_x^2}{2m}+\delta(t)V(x)$
V(x)
x
$F\Delta t\Delta x$

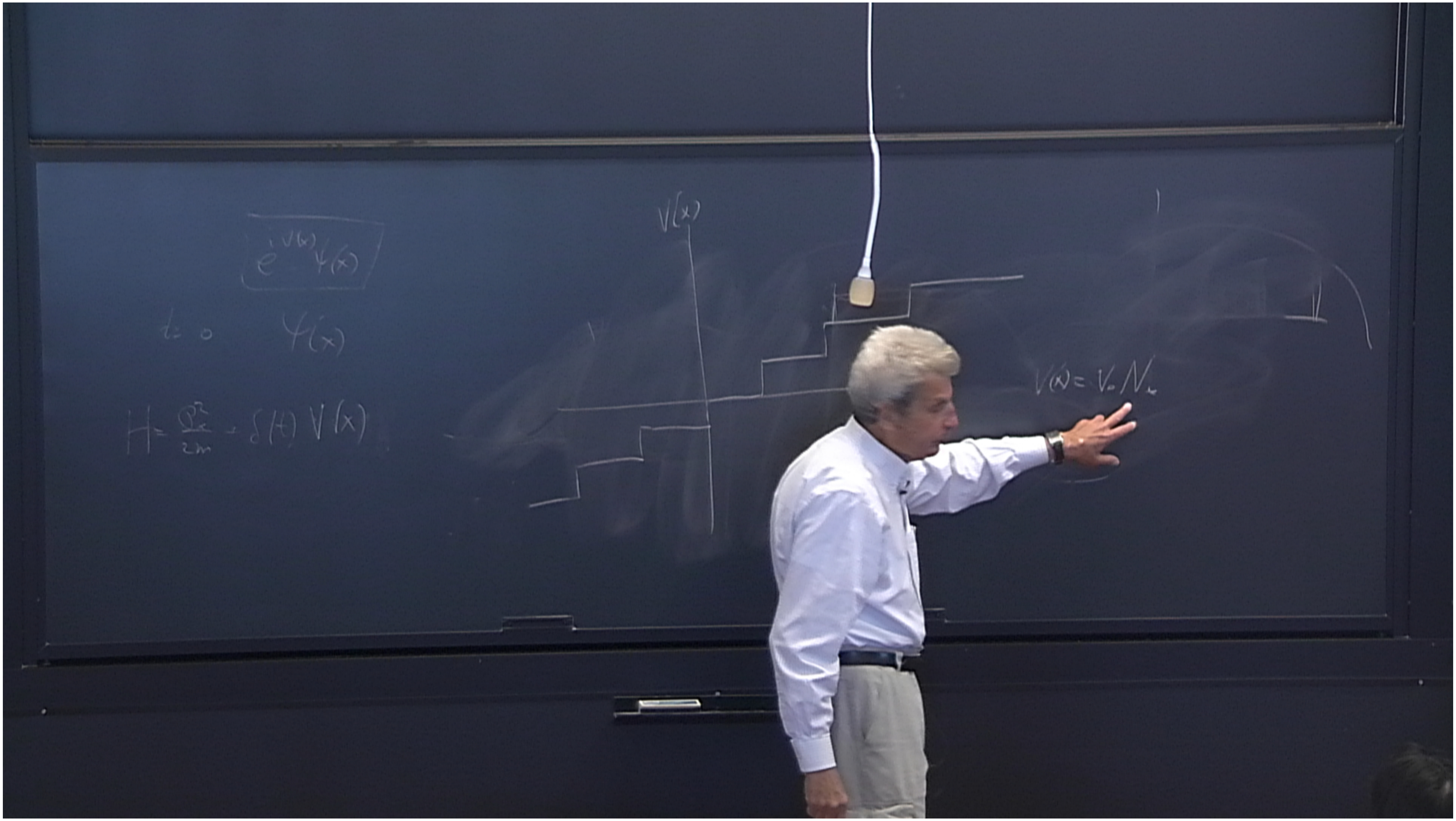

t = 0
V(x)
F Δt Δx

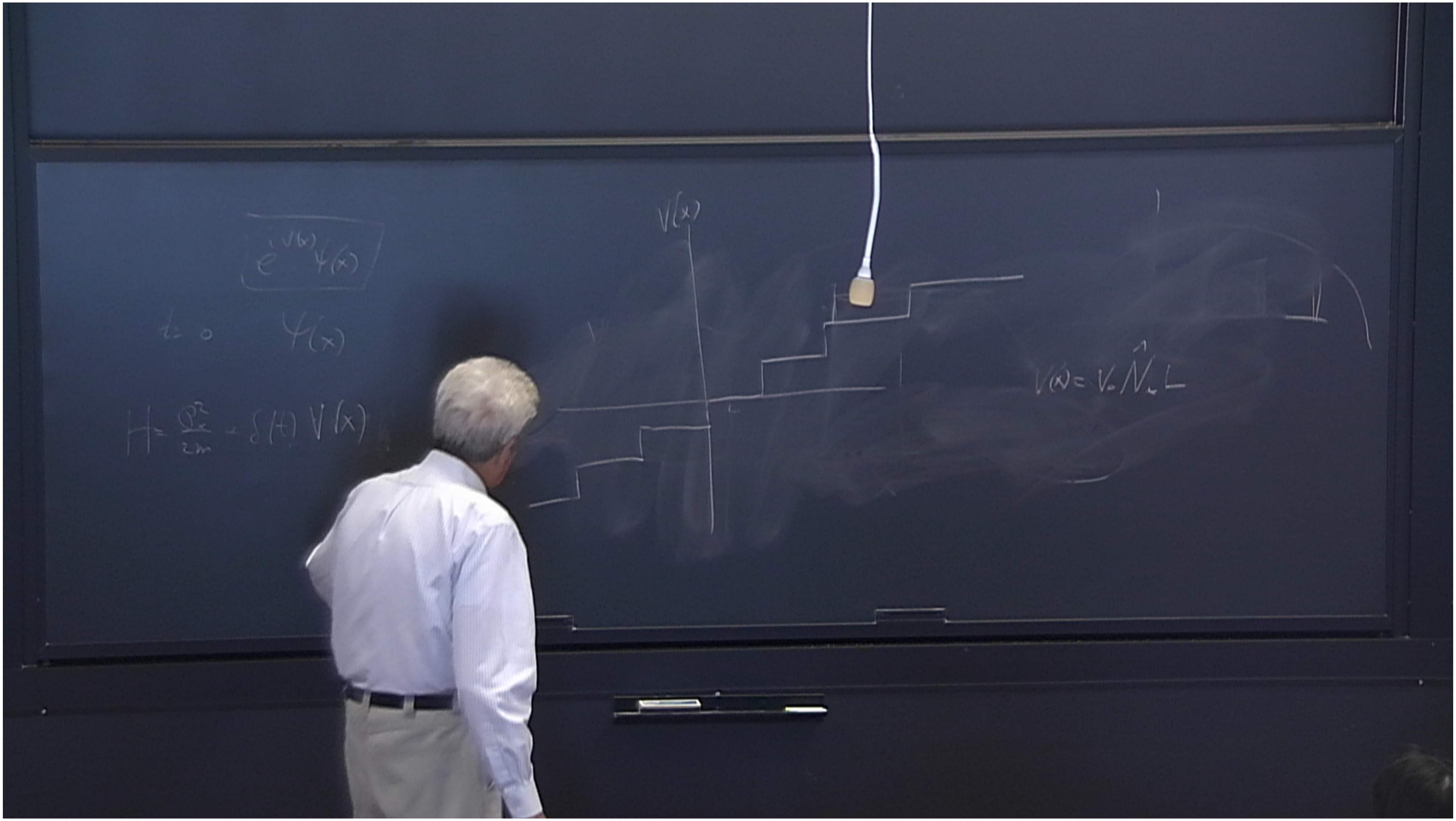


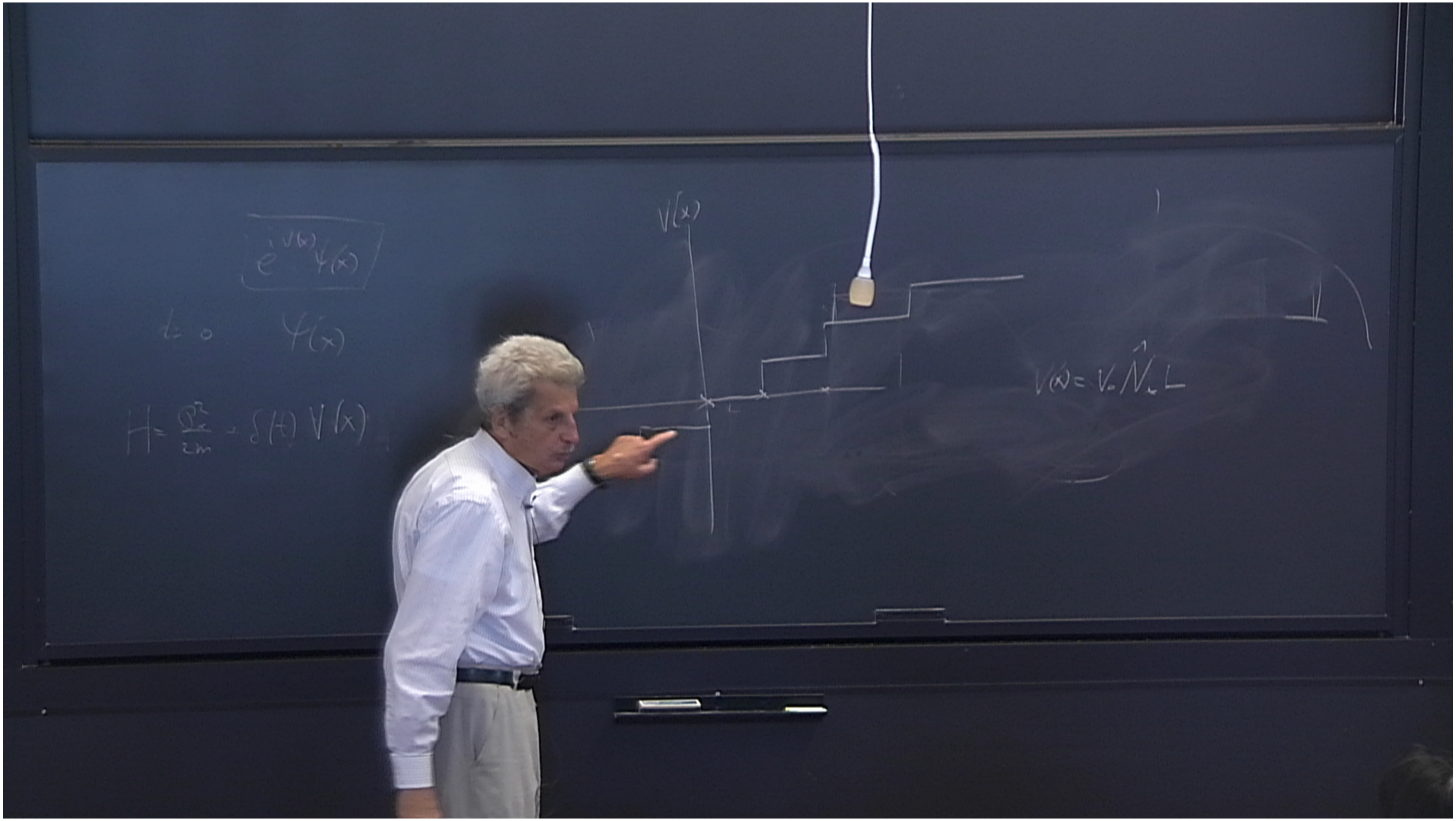
F ∆t ∆x



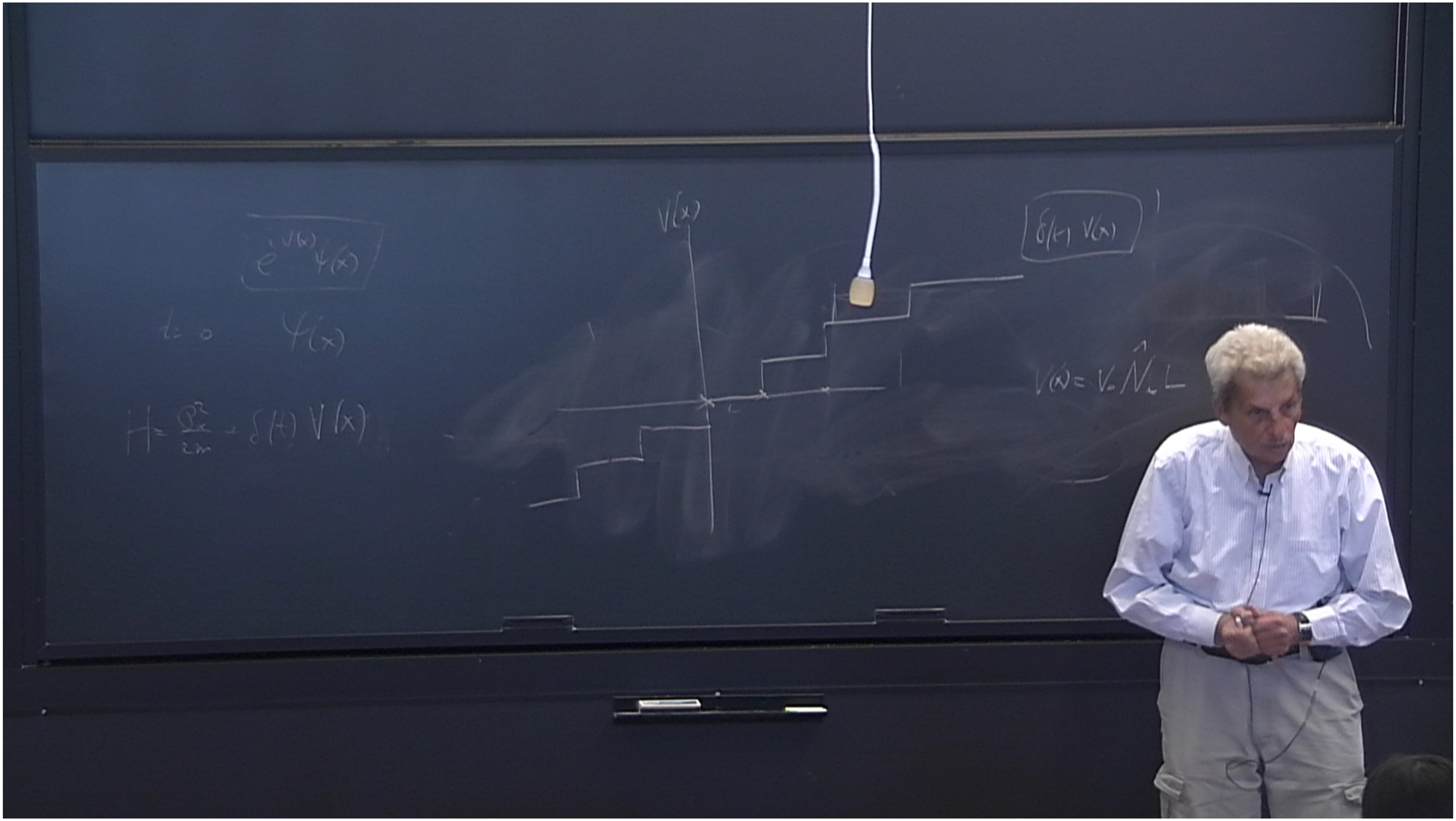
V(x)
Fδtδx.

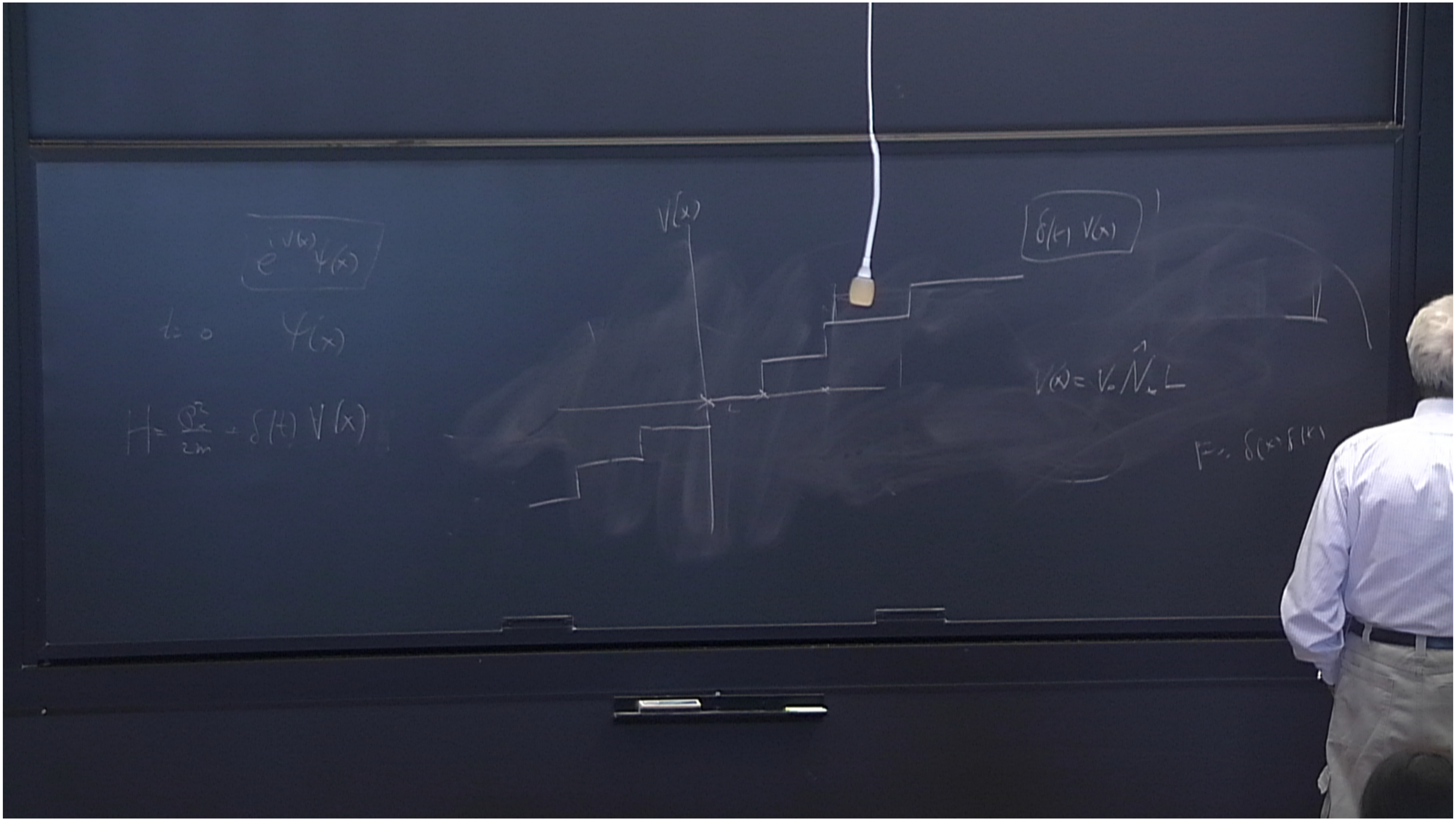

V(x)
t = 0 ψ(x)
V(x) = V₀ N_w


V(x)
t=0 ψ(x)



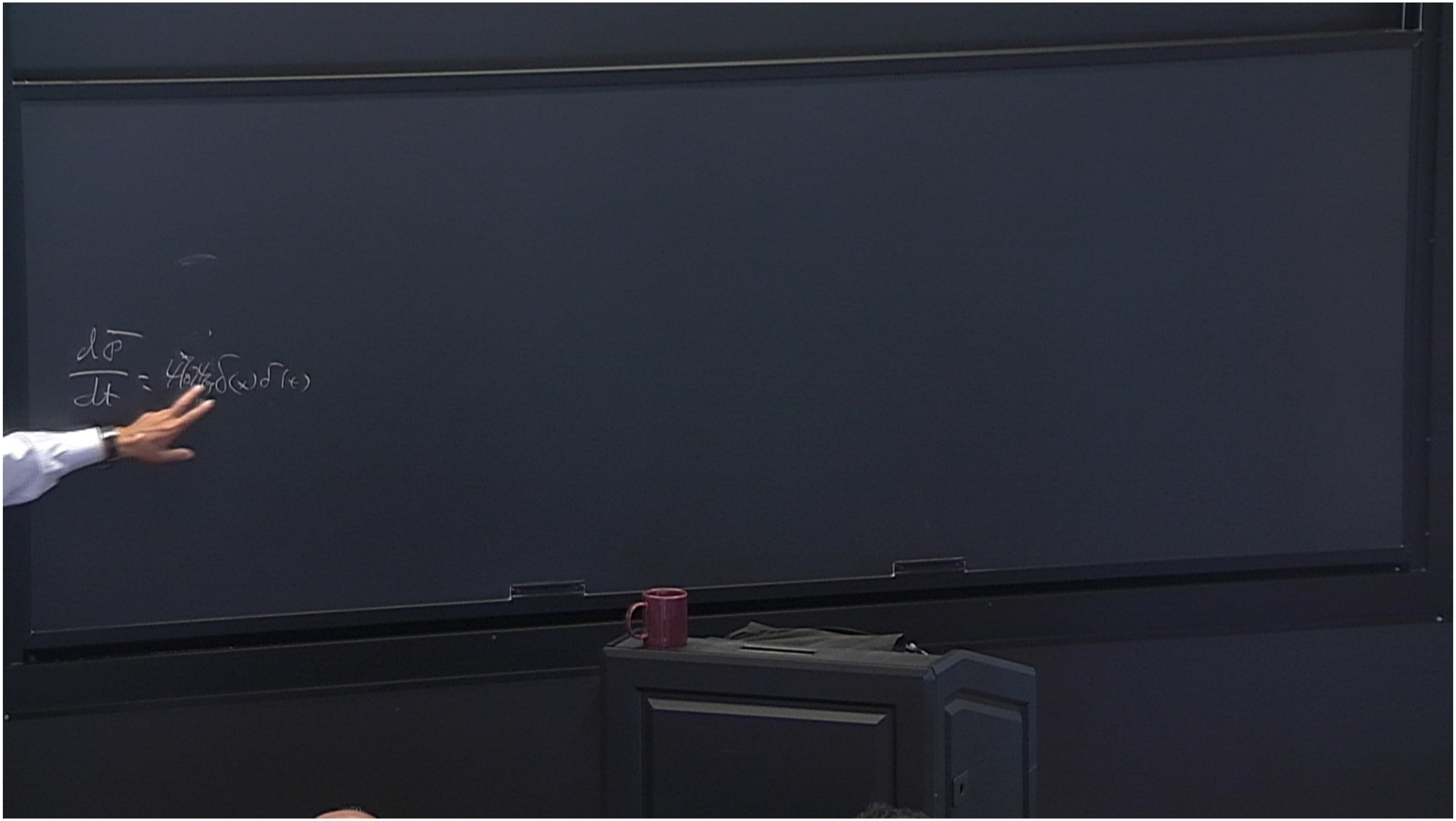
V(x)
$e^{iV(x)}\psi(x)$
$t=0$ $\psi(x)$
$H=\frac{p_x^2}{2m}+\delta(t)V(x)$
$V(x)=V_0\hat{N}_x L$

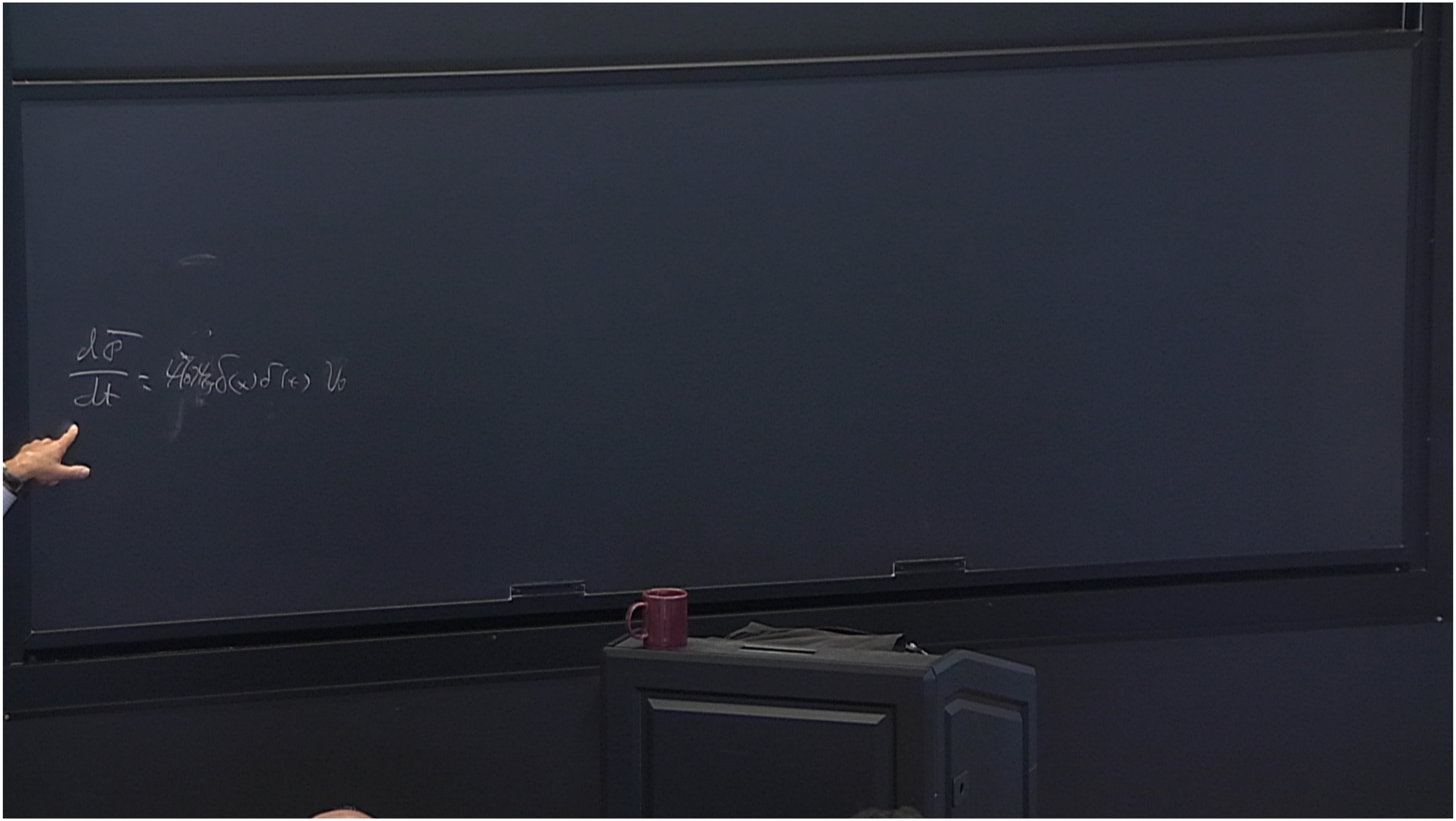


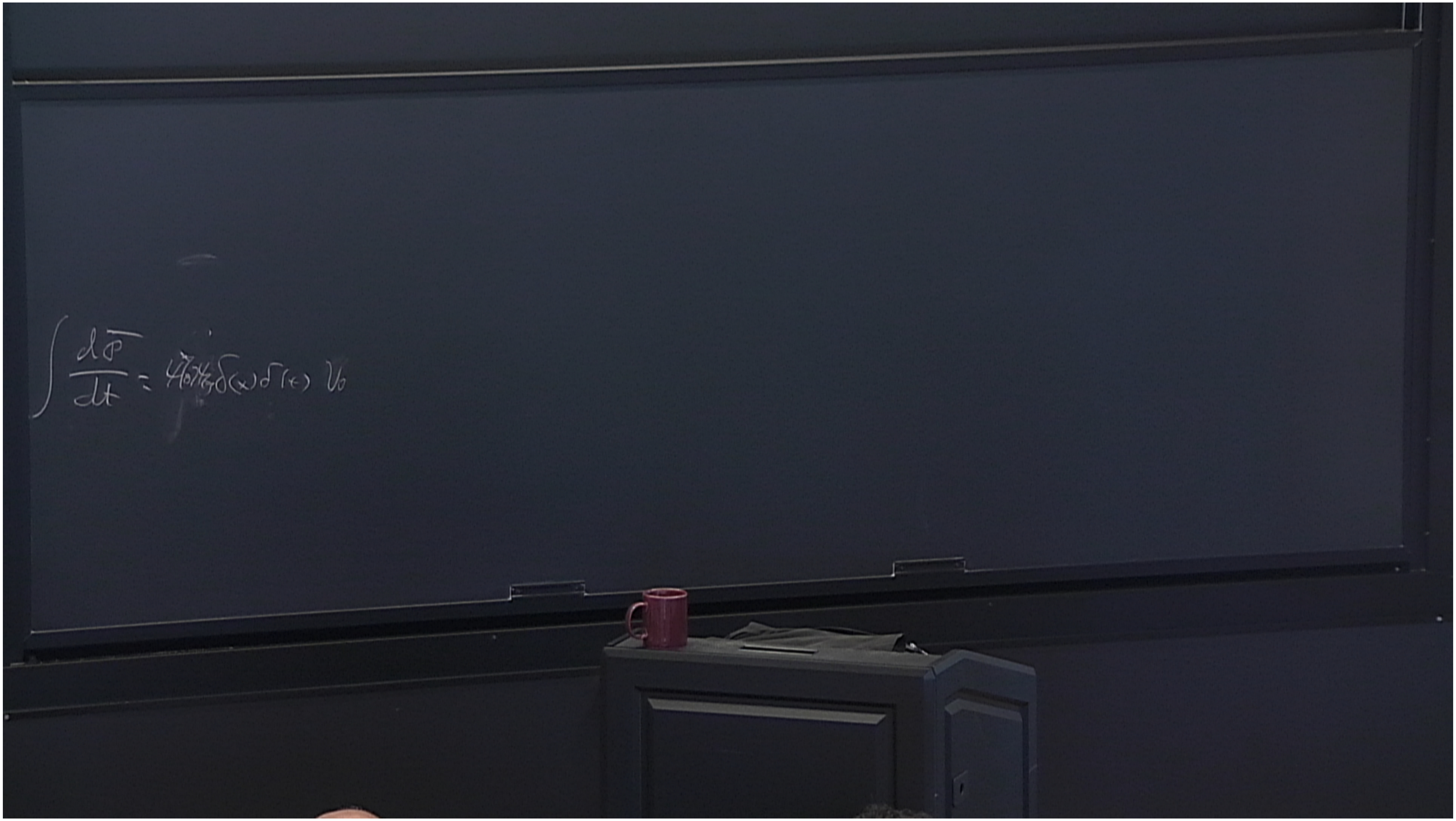


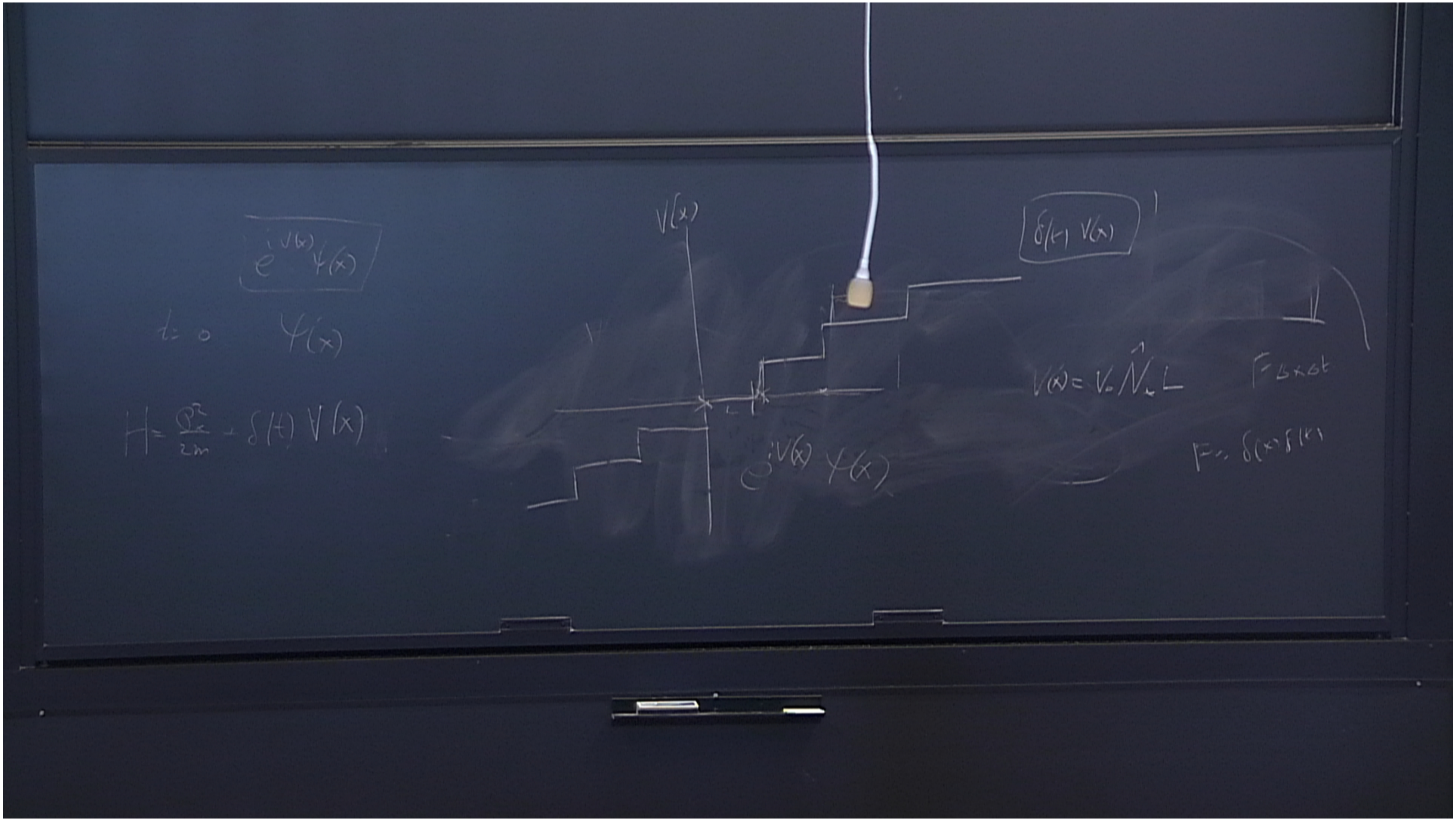
$e^{iV(x)}\psi(x)$
$t=0 \quad \psi(x)$
$H = \frac{p_x^2}{2m} + \delta(t) V(x)$
$V(x)$
$\delta(t) V(x)$
$V(x) = V_0 \hat{N}_x L$

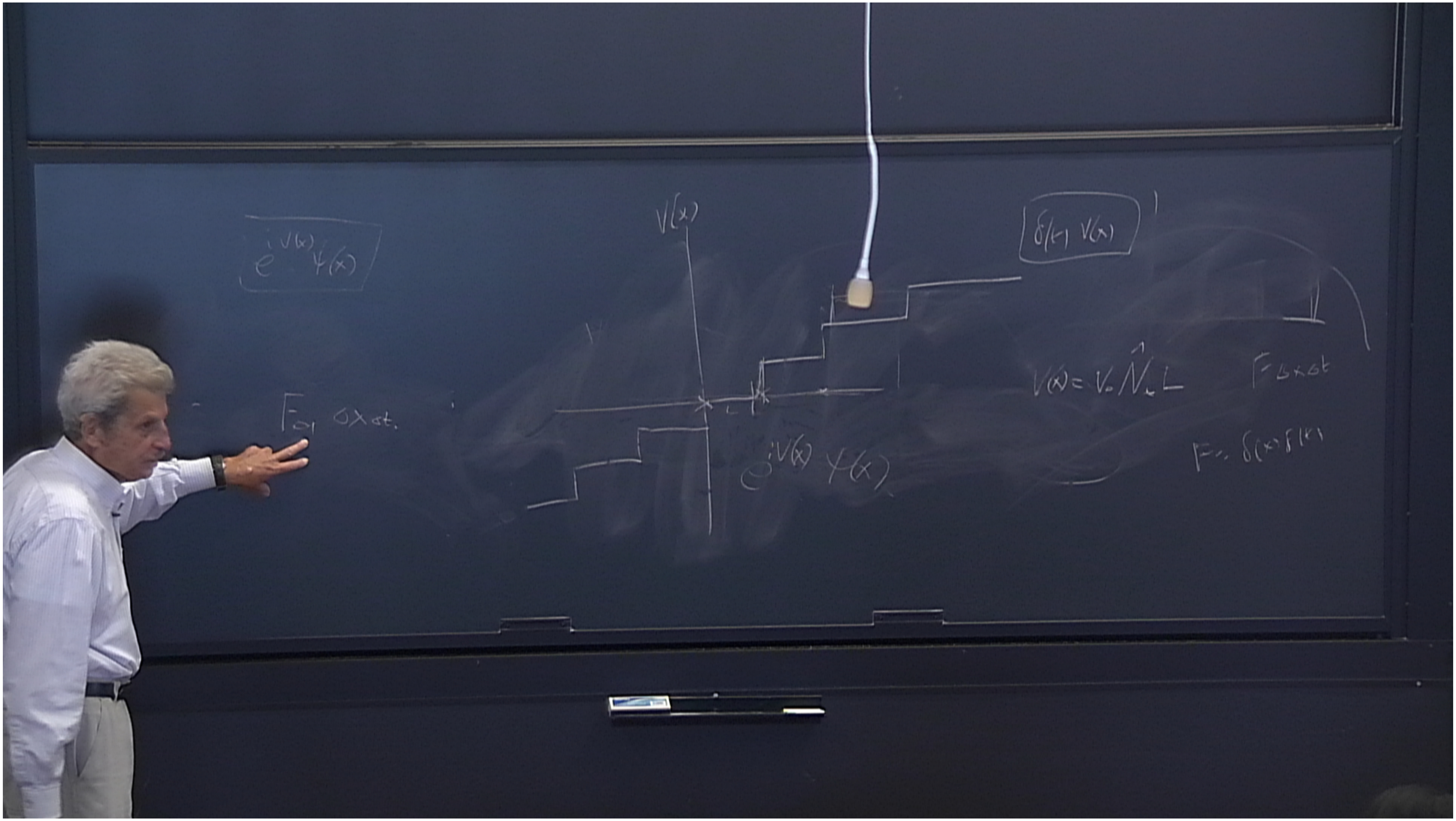

$\frac{d\bar{p}}{dt} = \bar{F}\delta(x)\delta(t)$

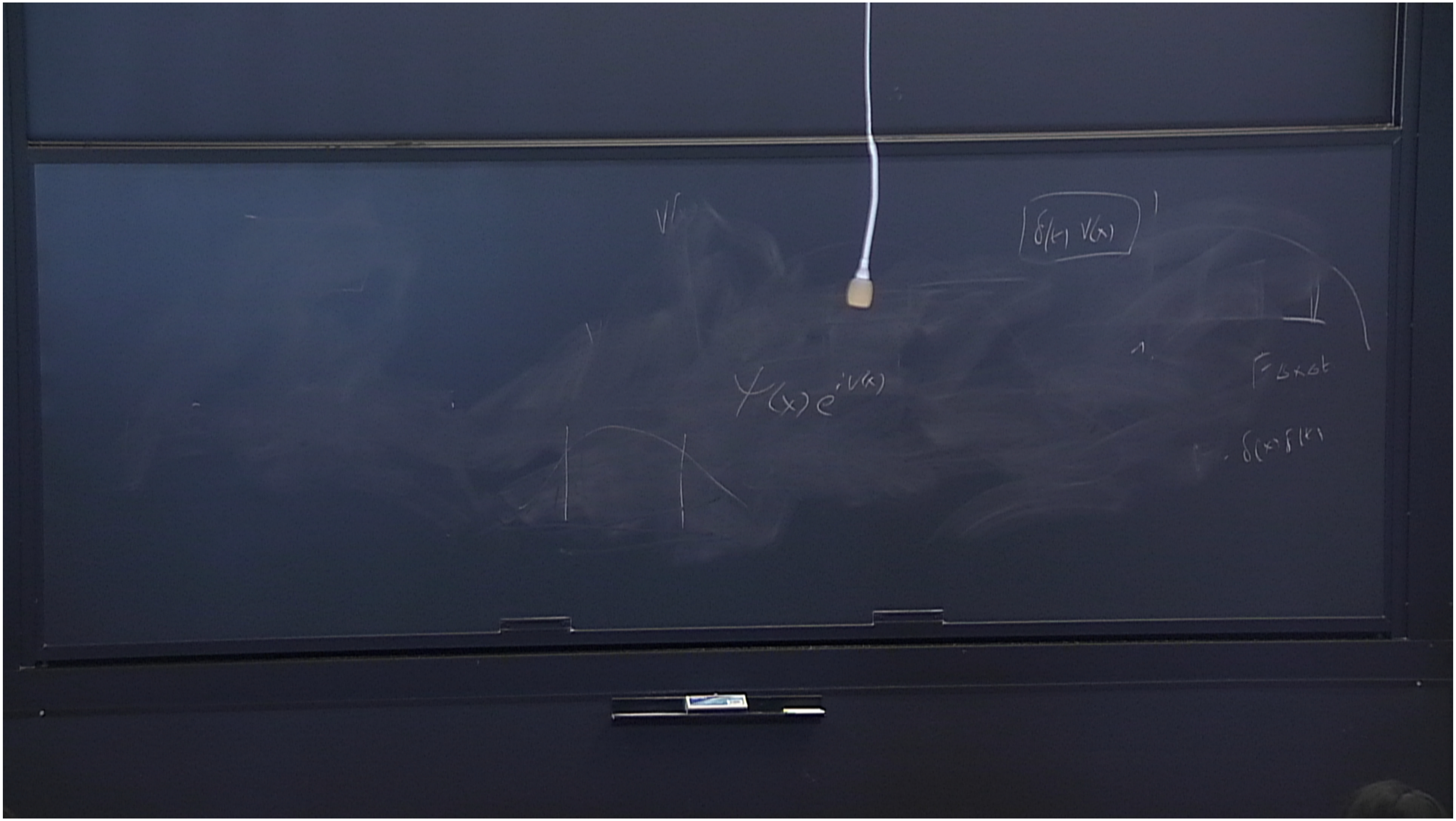


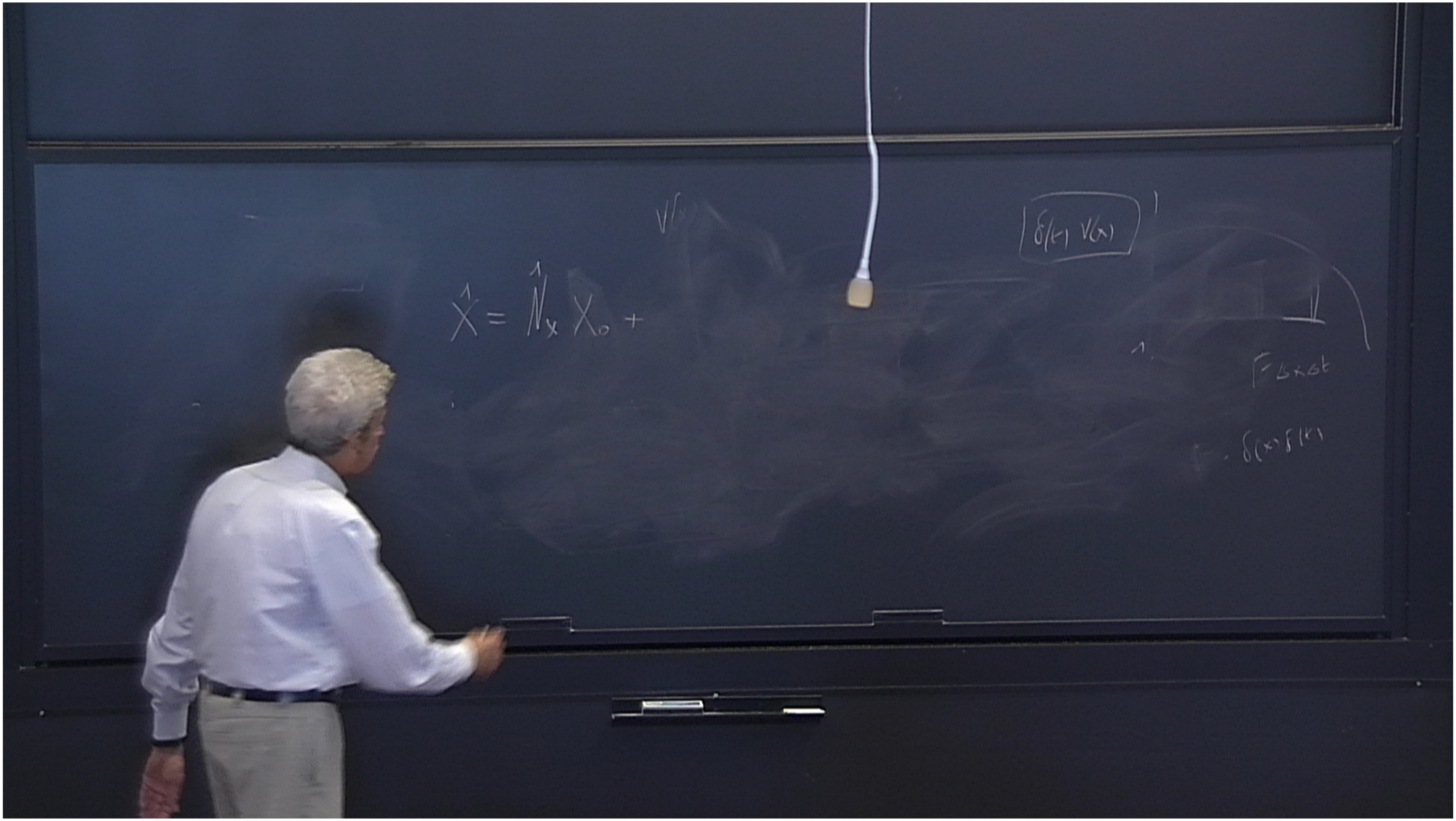

dP̄/dt =
δ(x) δ(t) v0

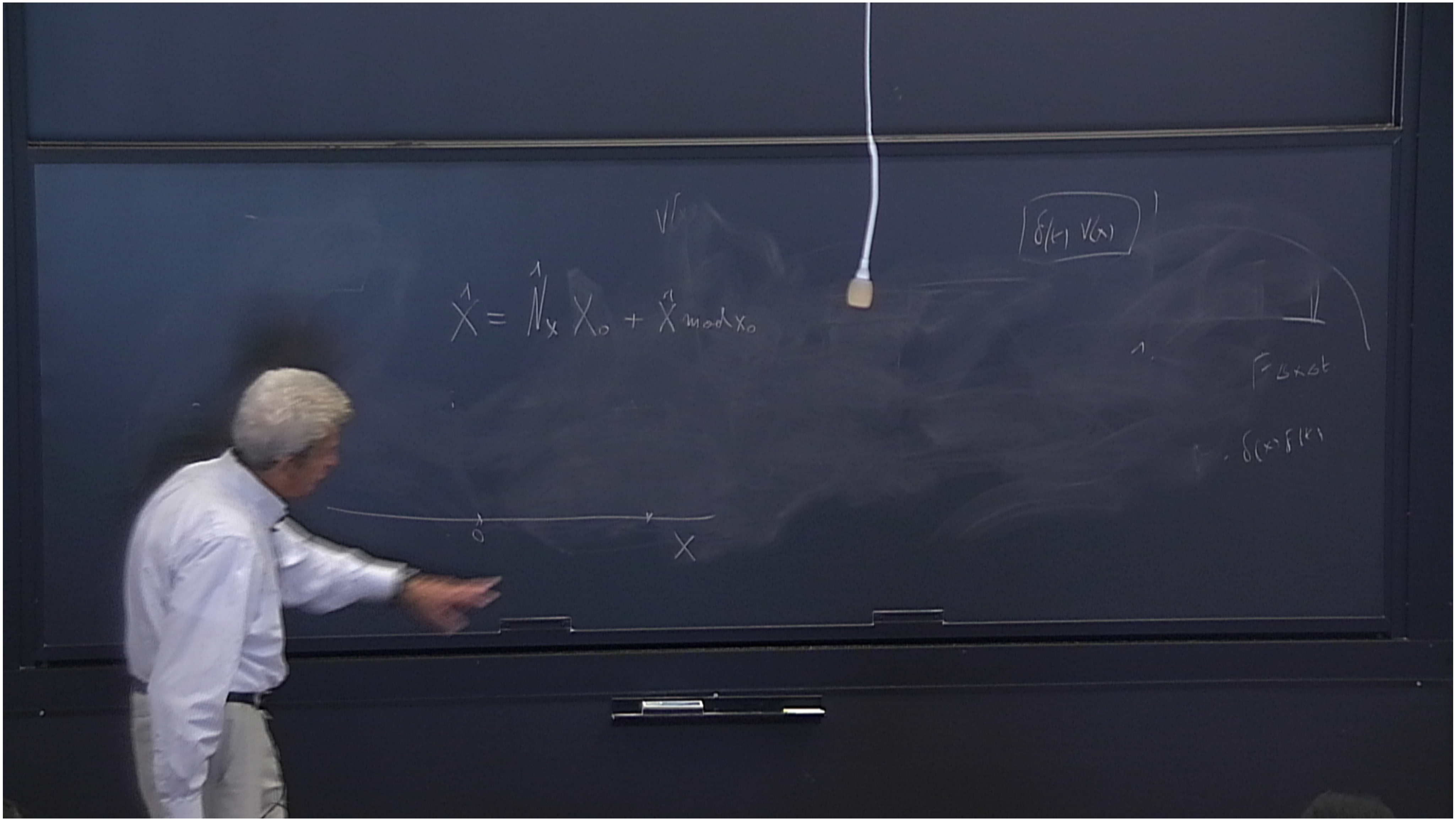


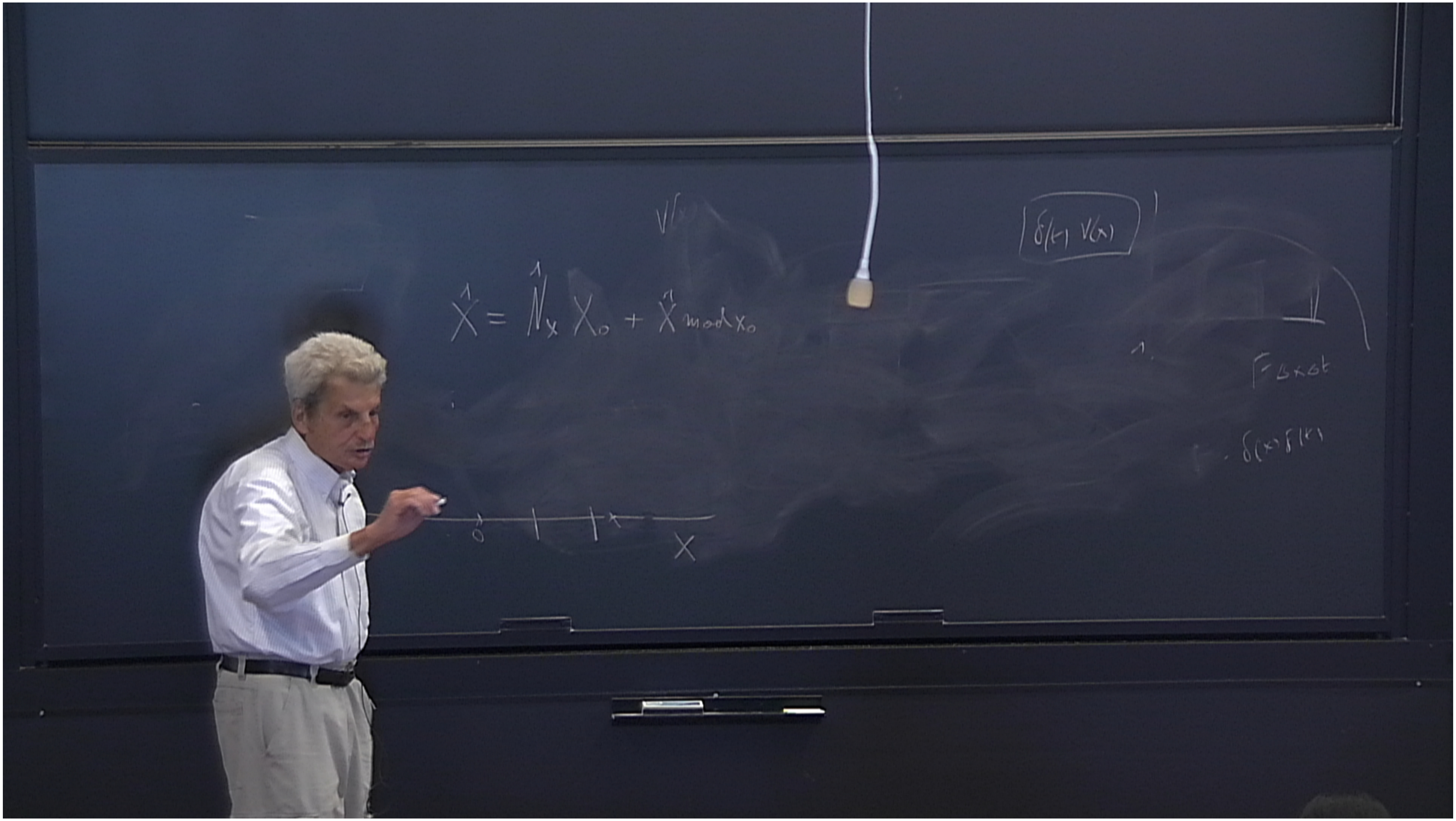

t = 0
V(x)
V(x) = V₀ N L

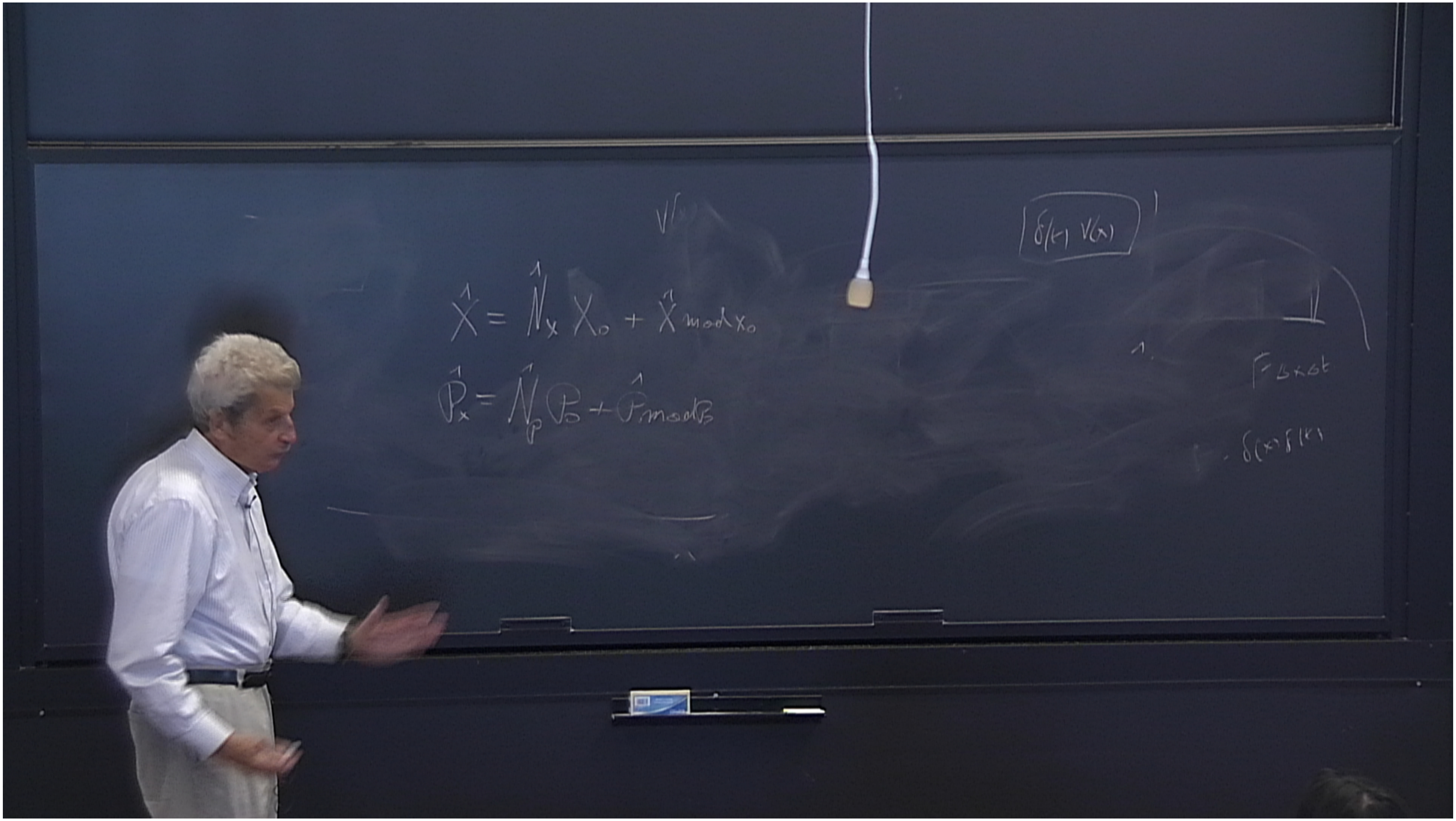

V(x)

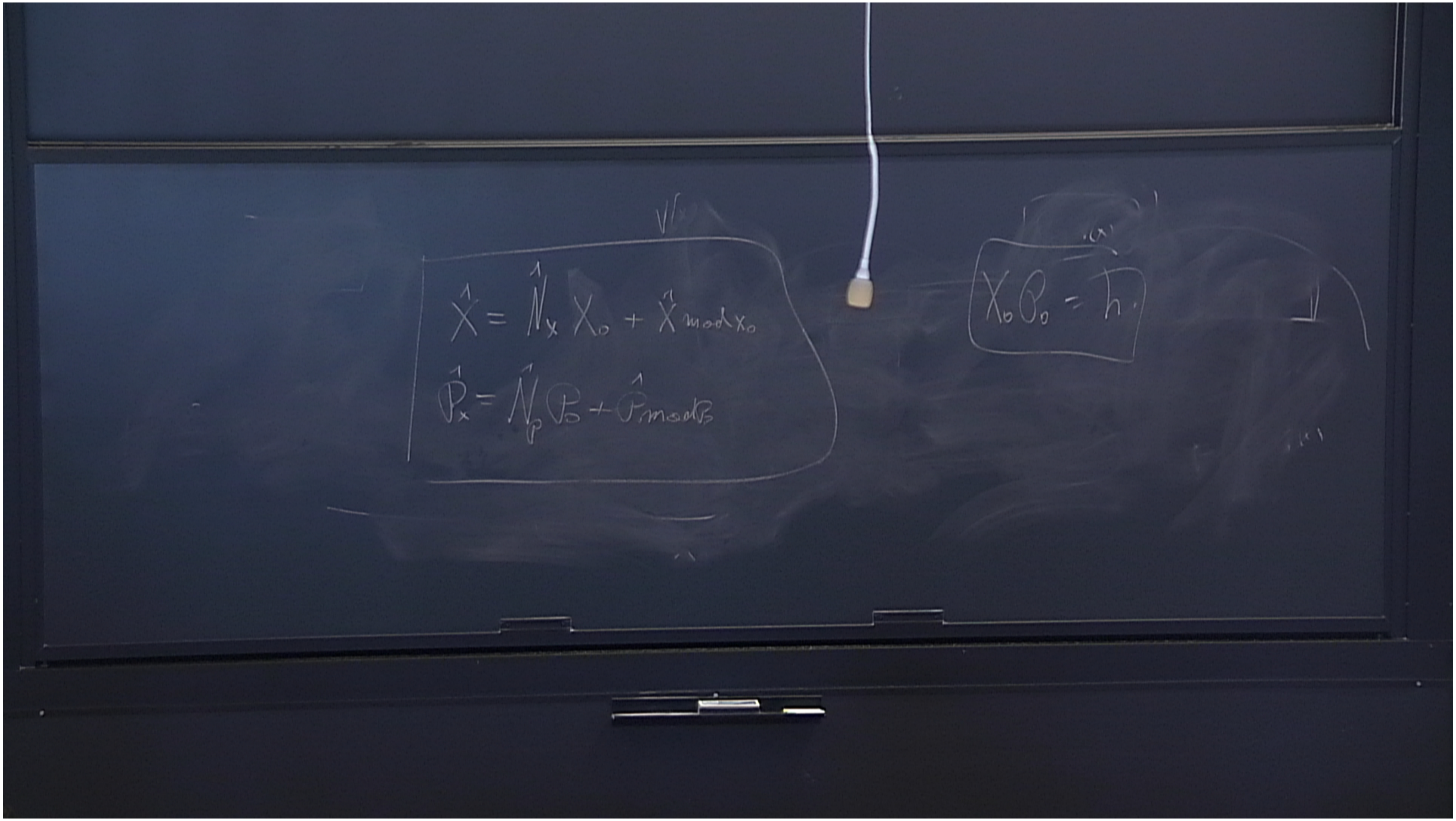

δ(x) V(x)
ψ(x) e^{iV(x)}

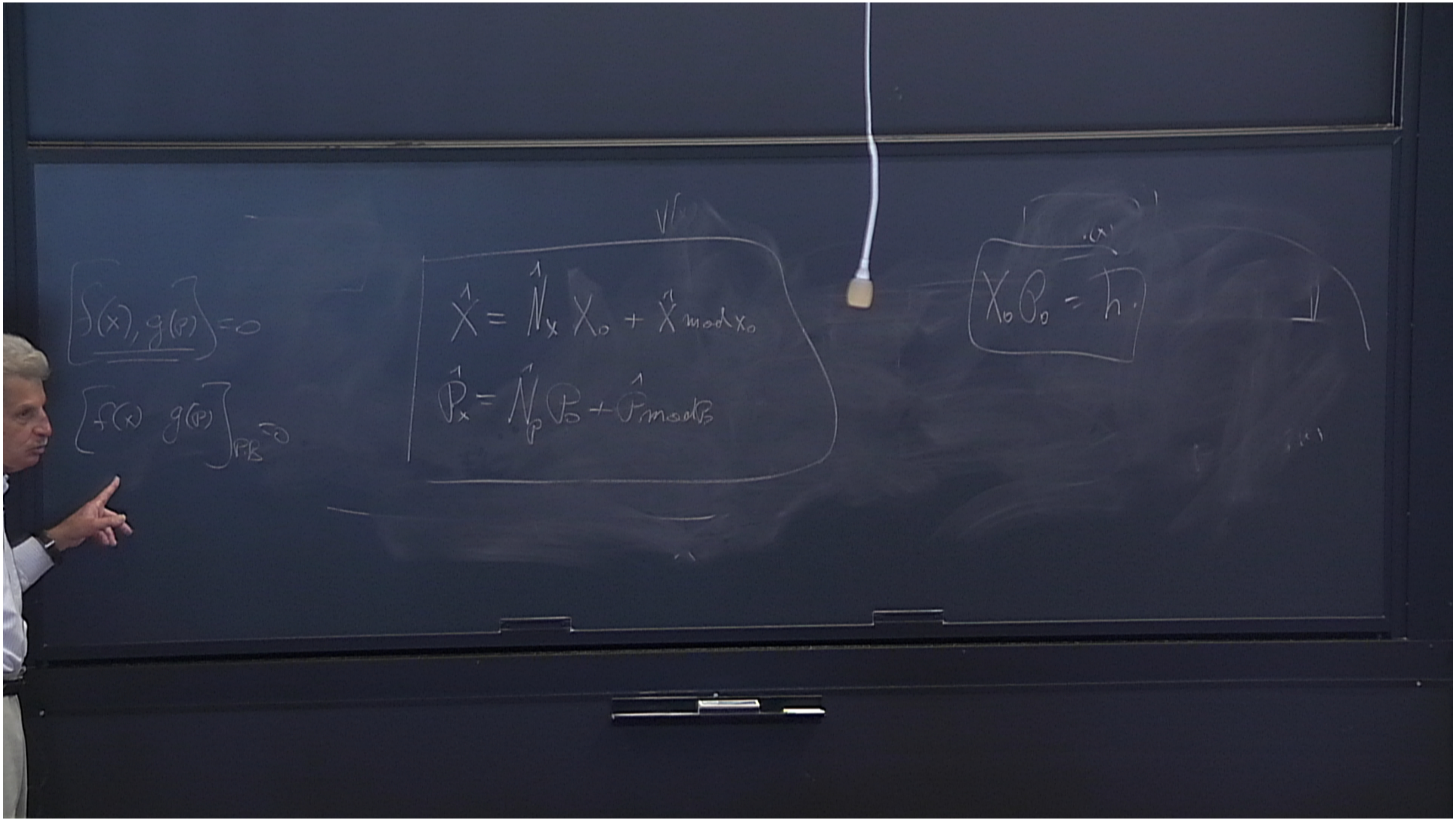

V(x)
δ(x) V(x)
X̂ = N̂x X0 +

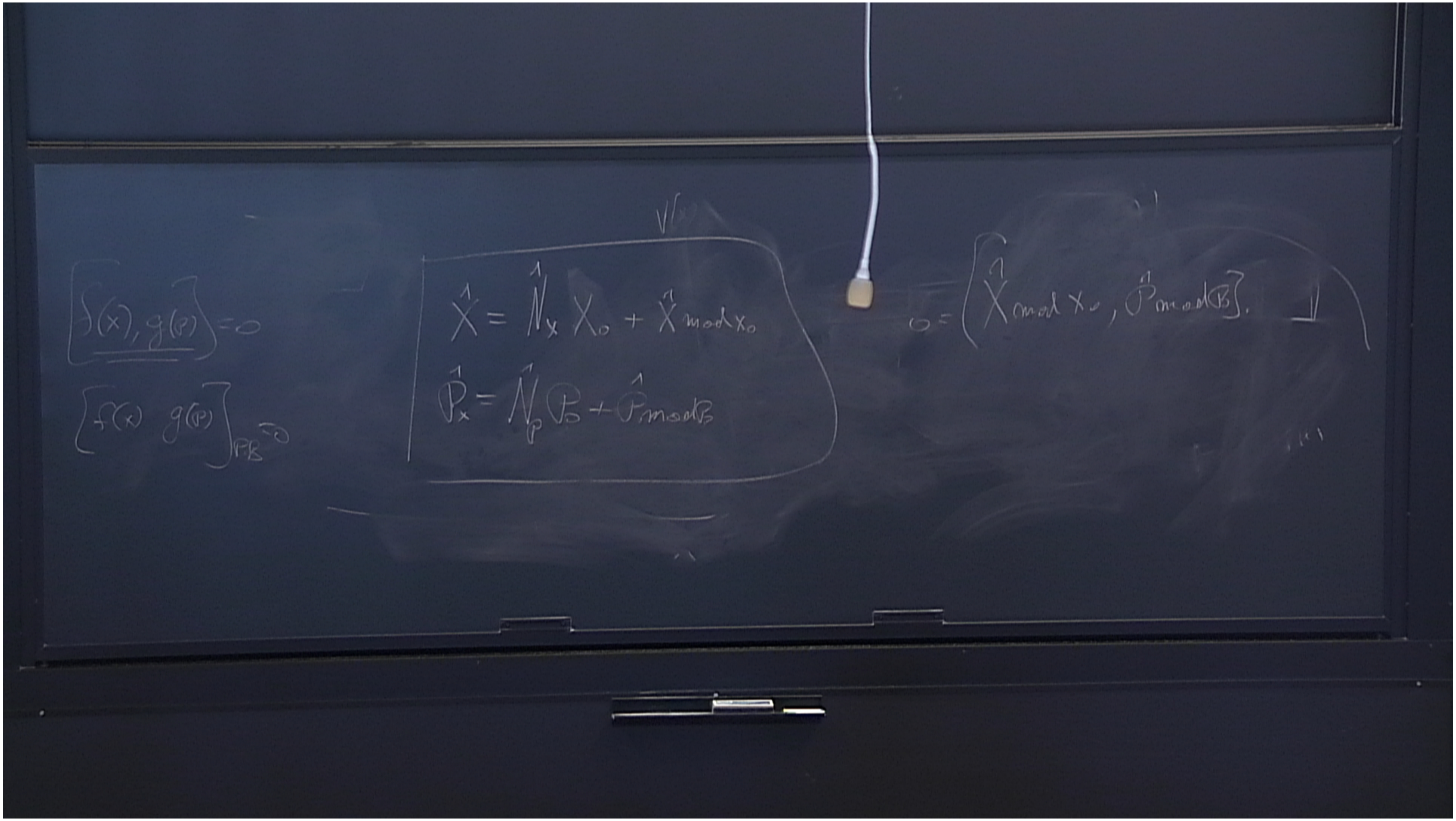

δ(x) V(x)
X̂ = N̂x X0 + X̂ mod x0
0
X

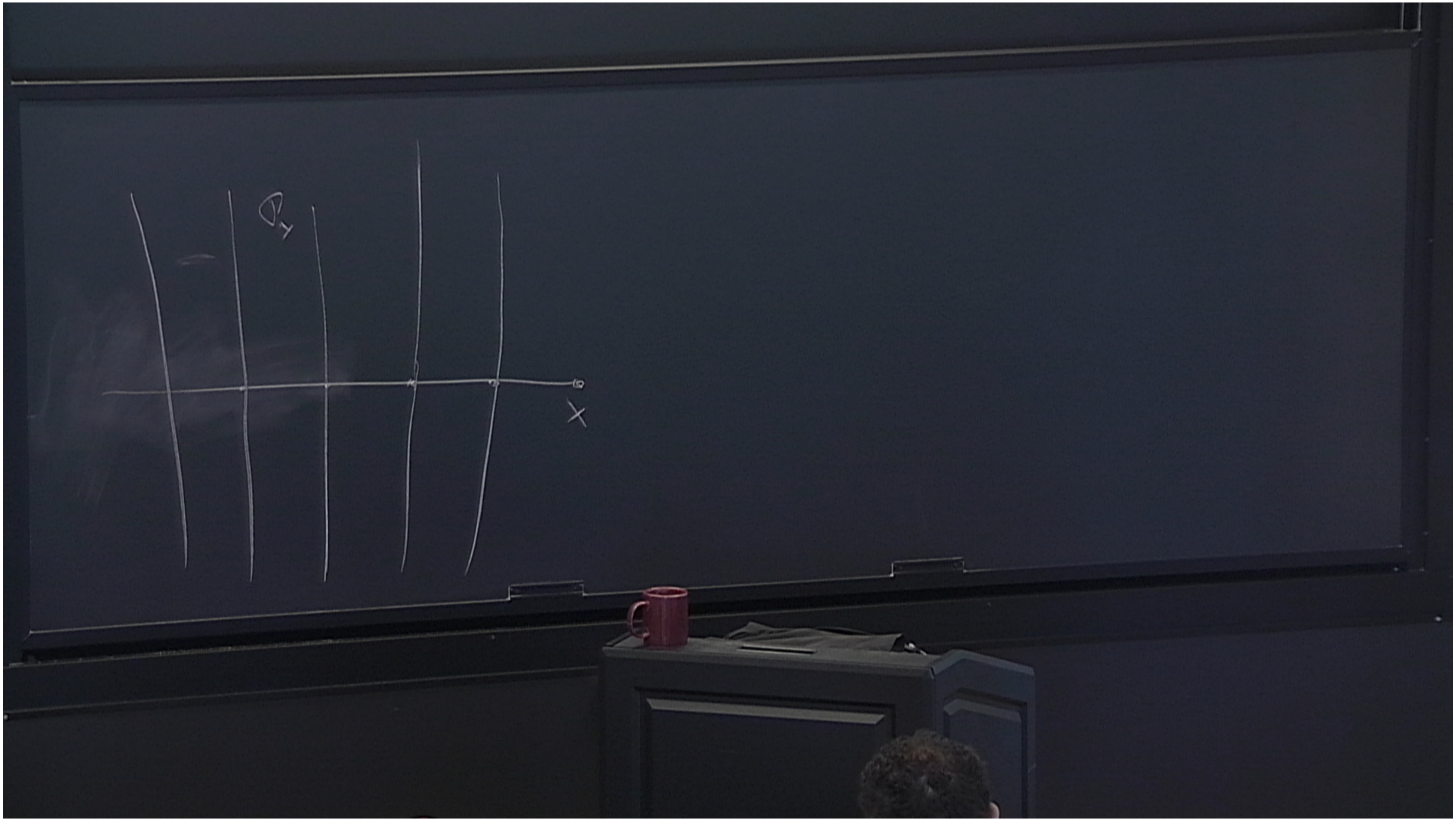

X = N_x X_0 + X mod x_0
δ(k) V(x)
F_{ΔxΔt}

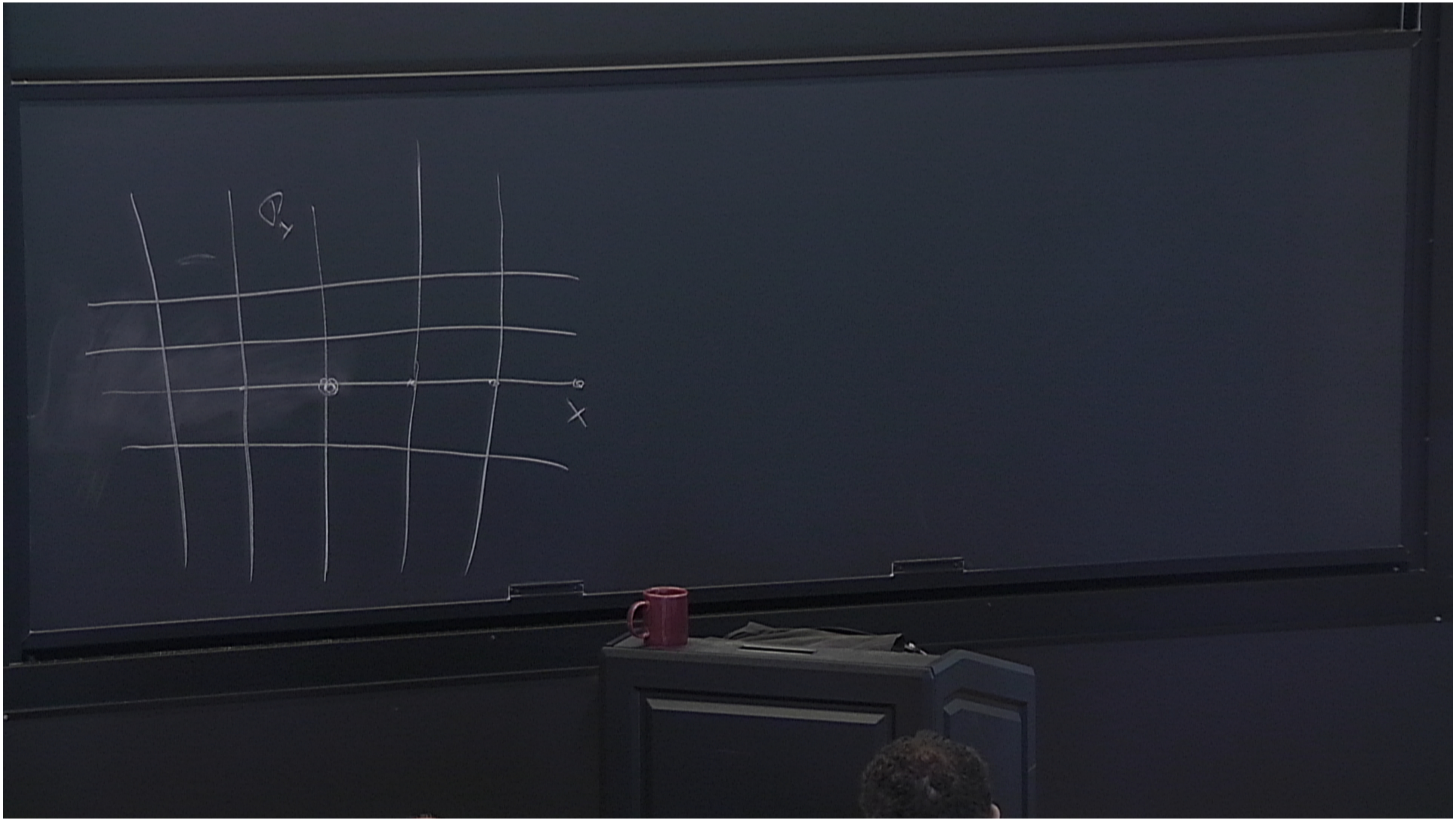

$\hat{X} = \hat{N}_x X_0 + \hat{X} \bmod X_0$
$\hat{P}_x = \hat{N}_p P_0 + \hat{P} \bmod P_0$
$\delta(x)\, V(x)$

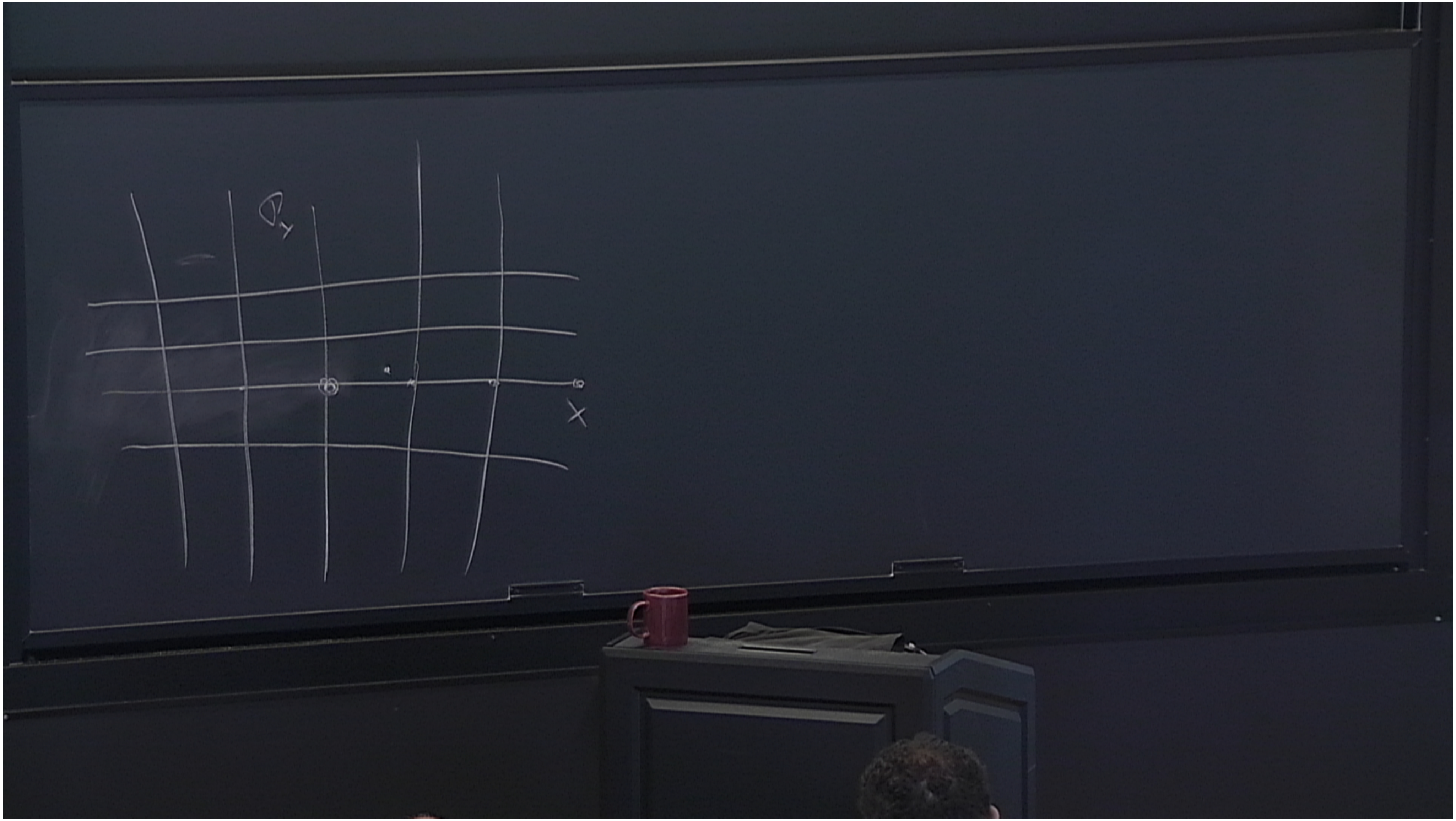

$\hat{X} = \hat{N}_x X_0 + \hat{X}_{\mathrm{mod}\, X_0}$
$\hat{P}_x = \hat{N}_p P_0 + \hat{P}_{\mathrm{mod}\, P_0}$
$X_0 P_0 = h$

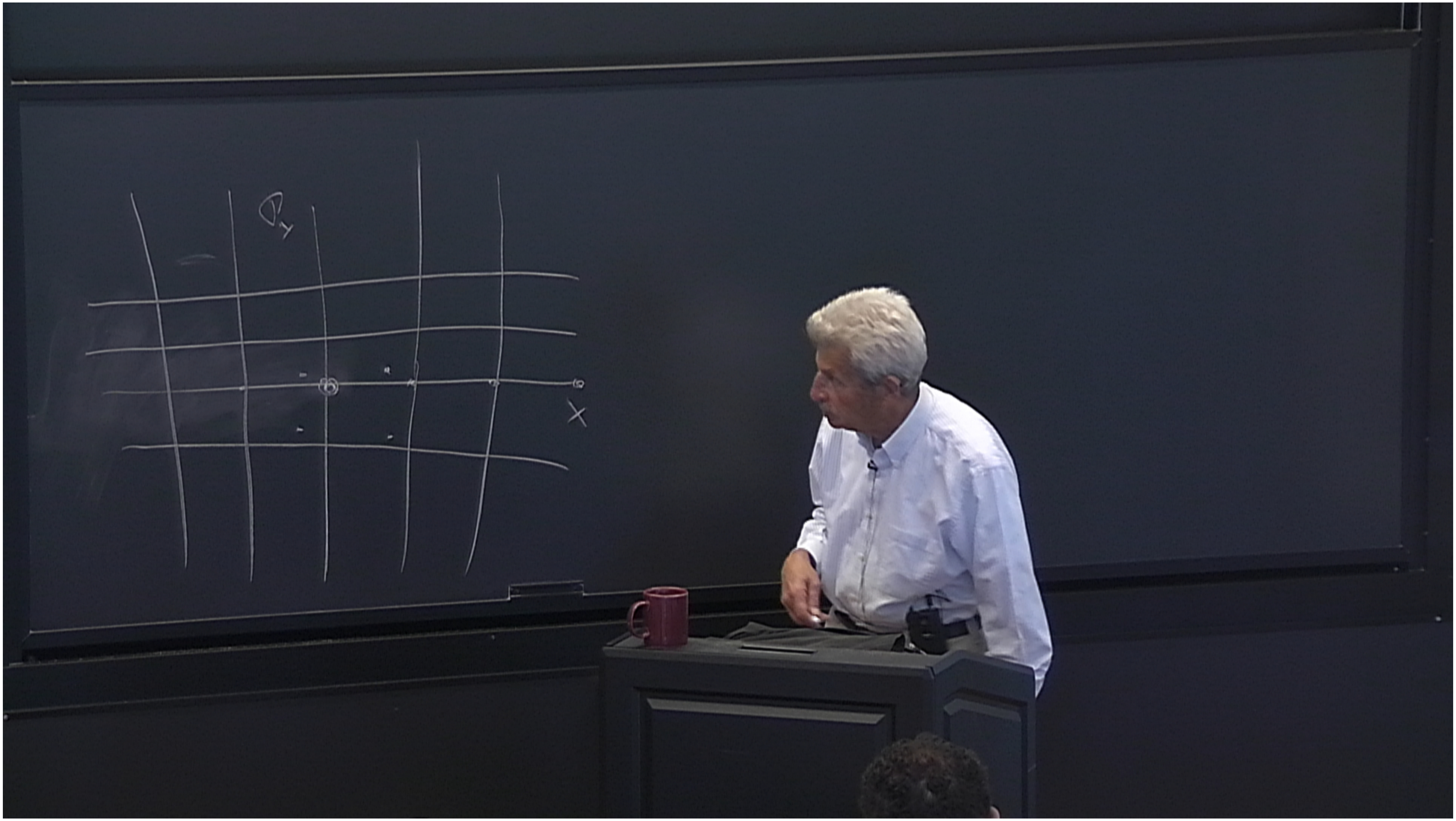

[f(x), g(p)] = 0
[f(x) g(p)]P.B = 0
X̂ = N̂x X0 + X̂ mod X0
P̂x = N̂p P0 + P̂ mod P0
X0 P0 = h

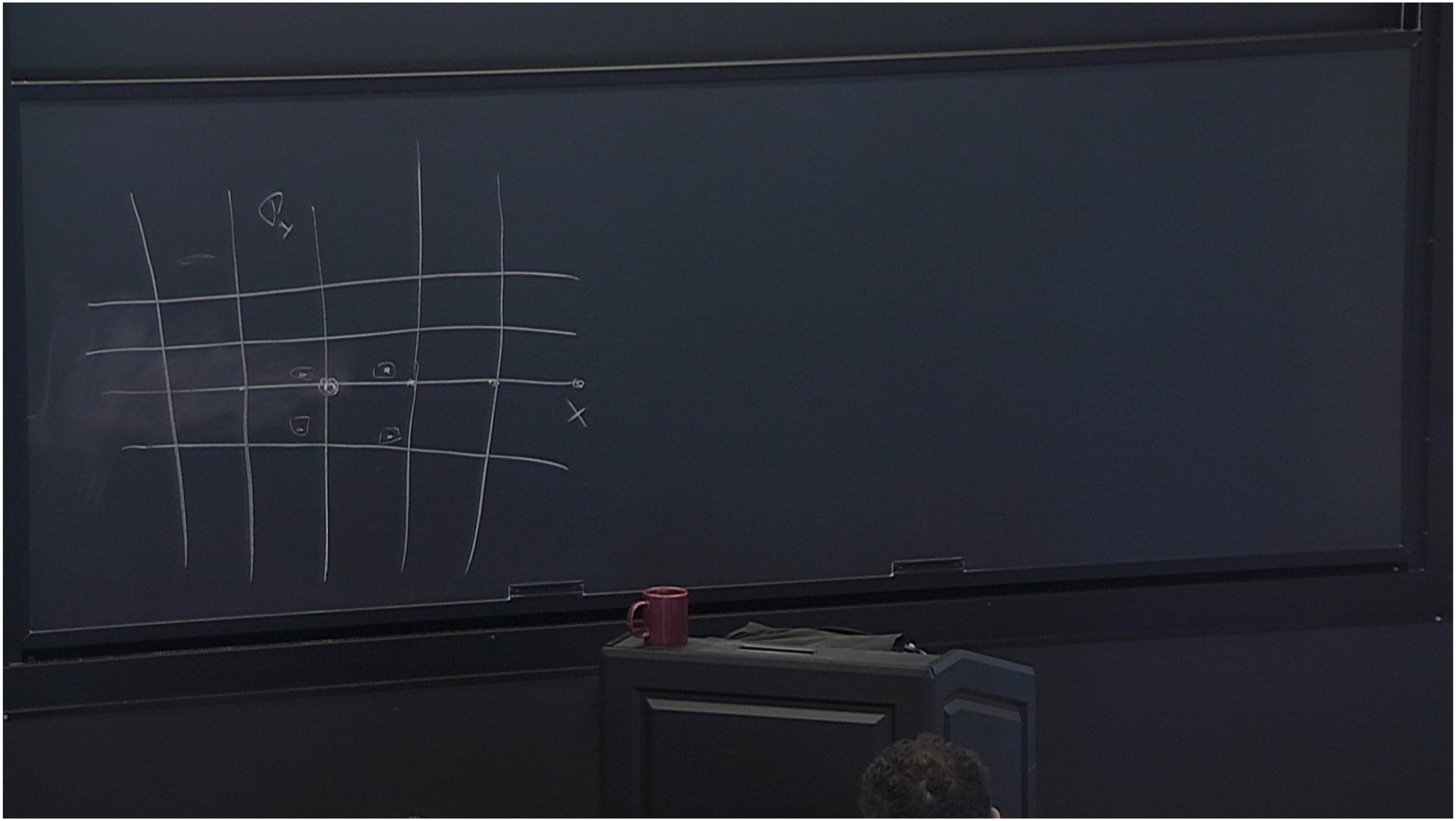

{f(x), g(p)} = 0
[f(x) g(p)]PB = 0
X = Nx X0 + X mod X0
Px = Np P0 + P mod P0
{X mod X0 , P mod P0}.

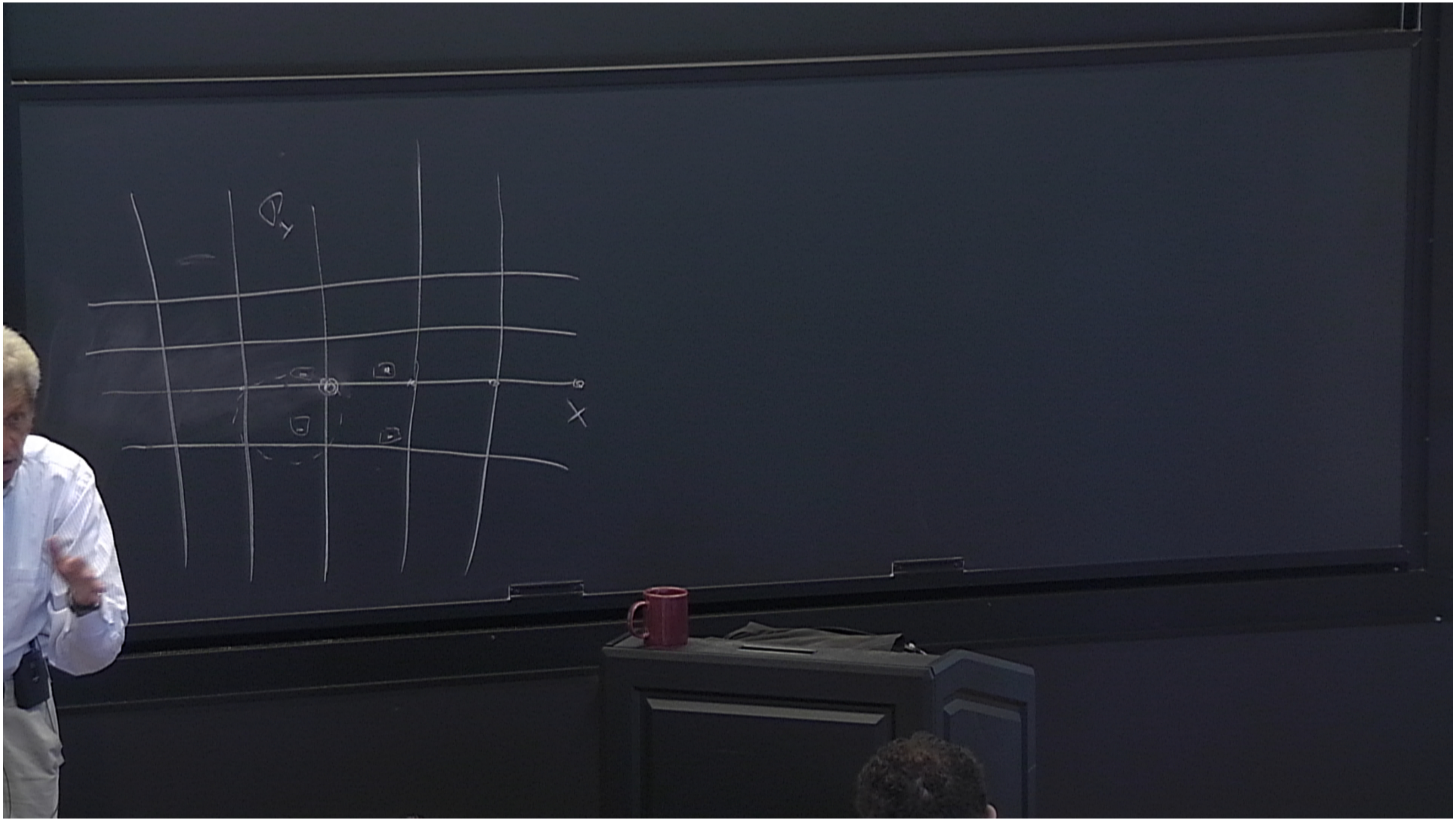


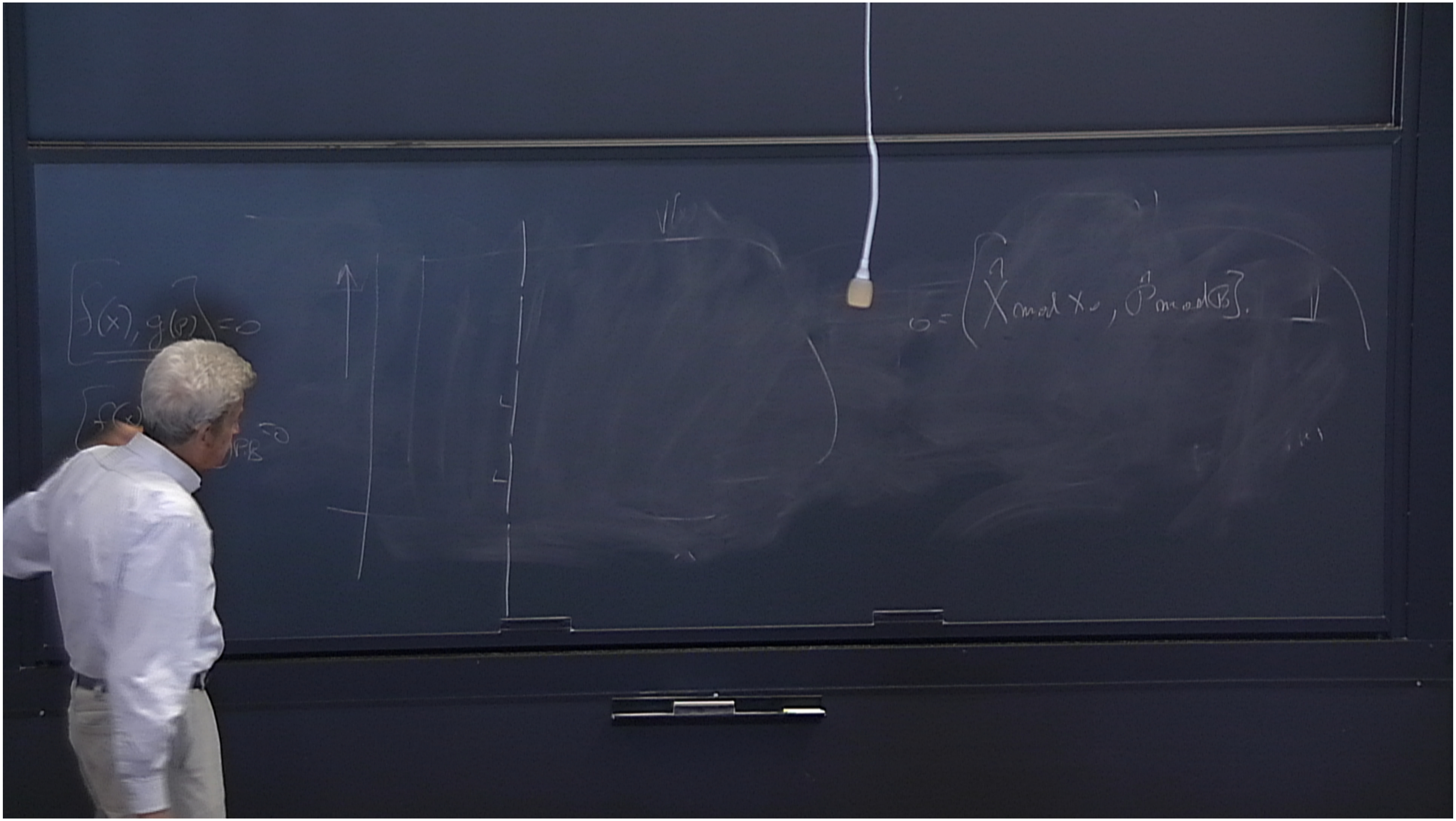


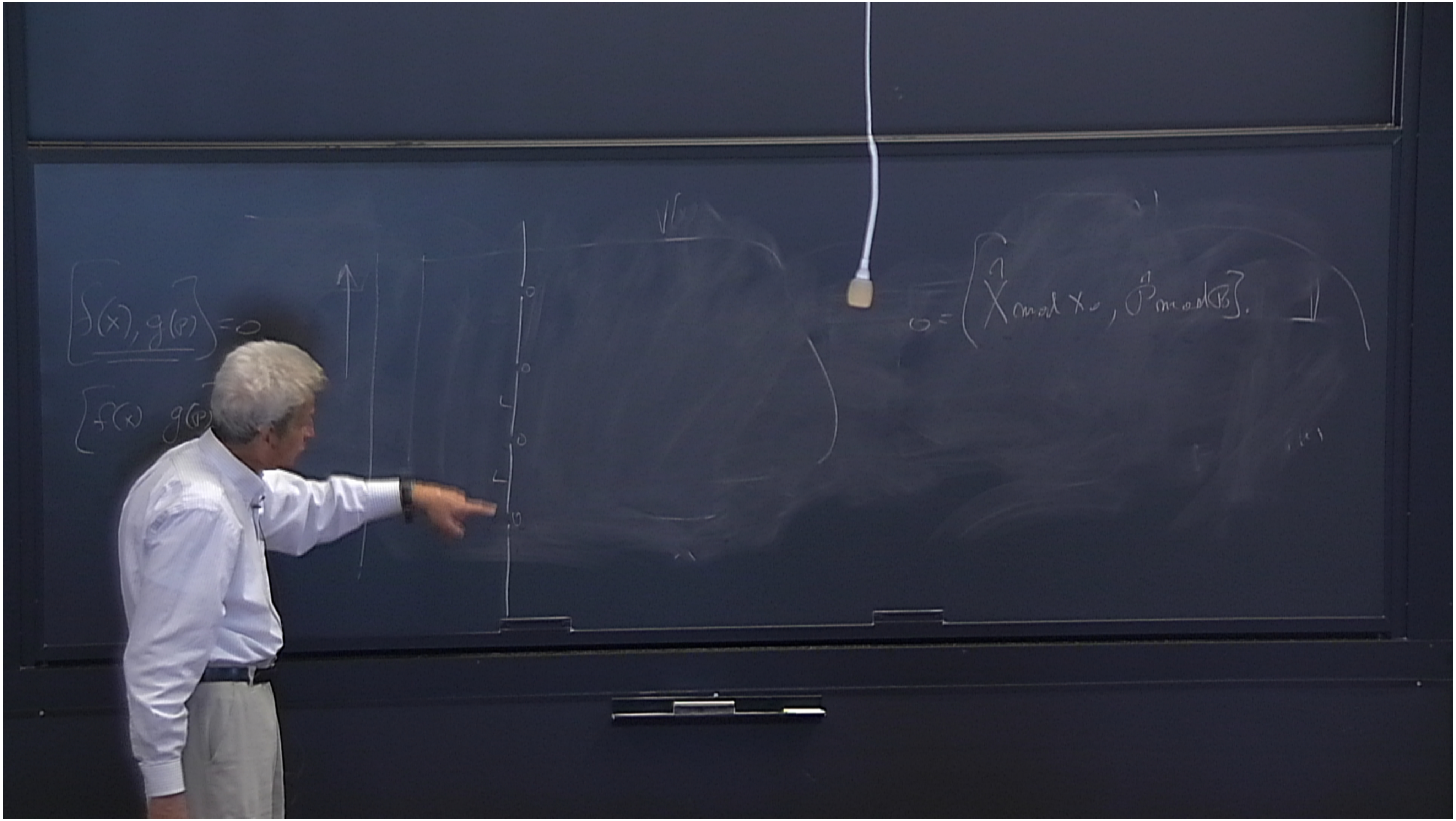


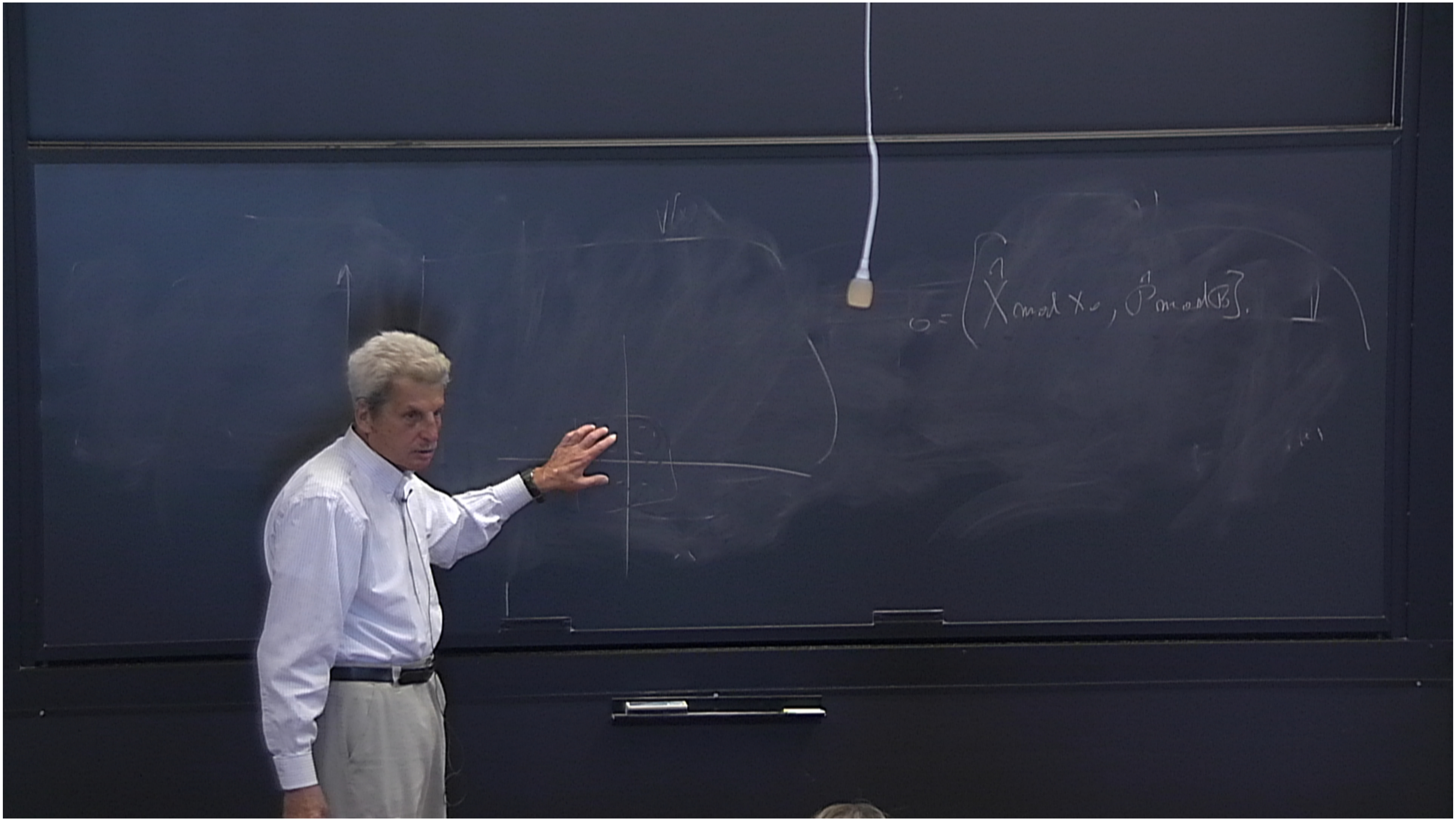


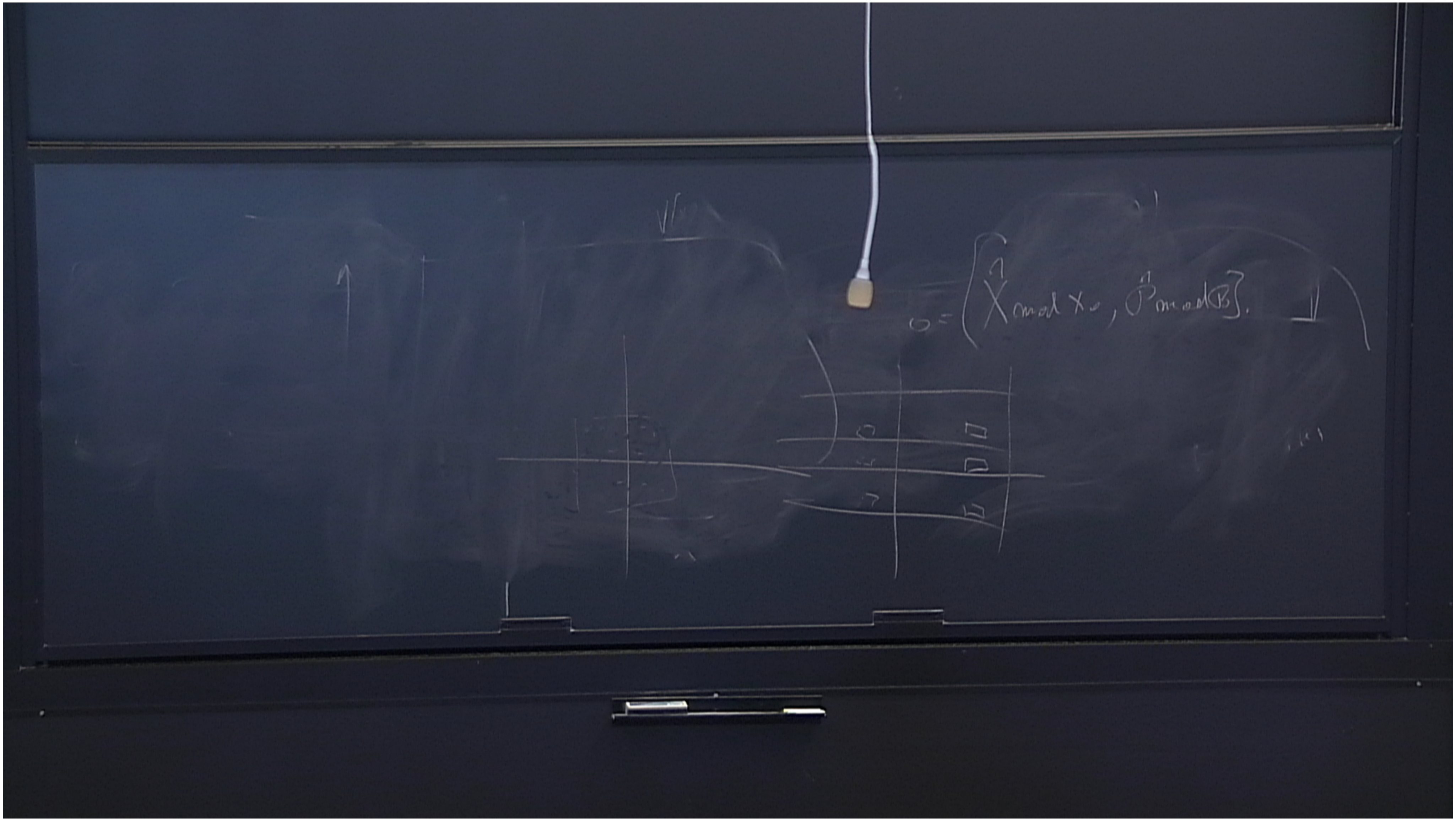


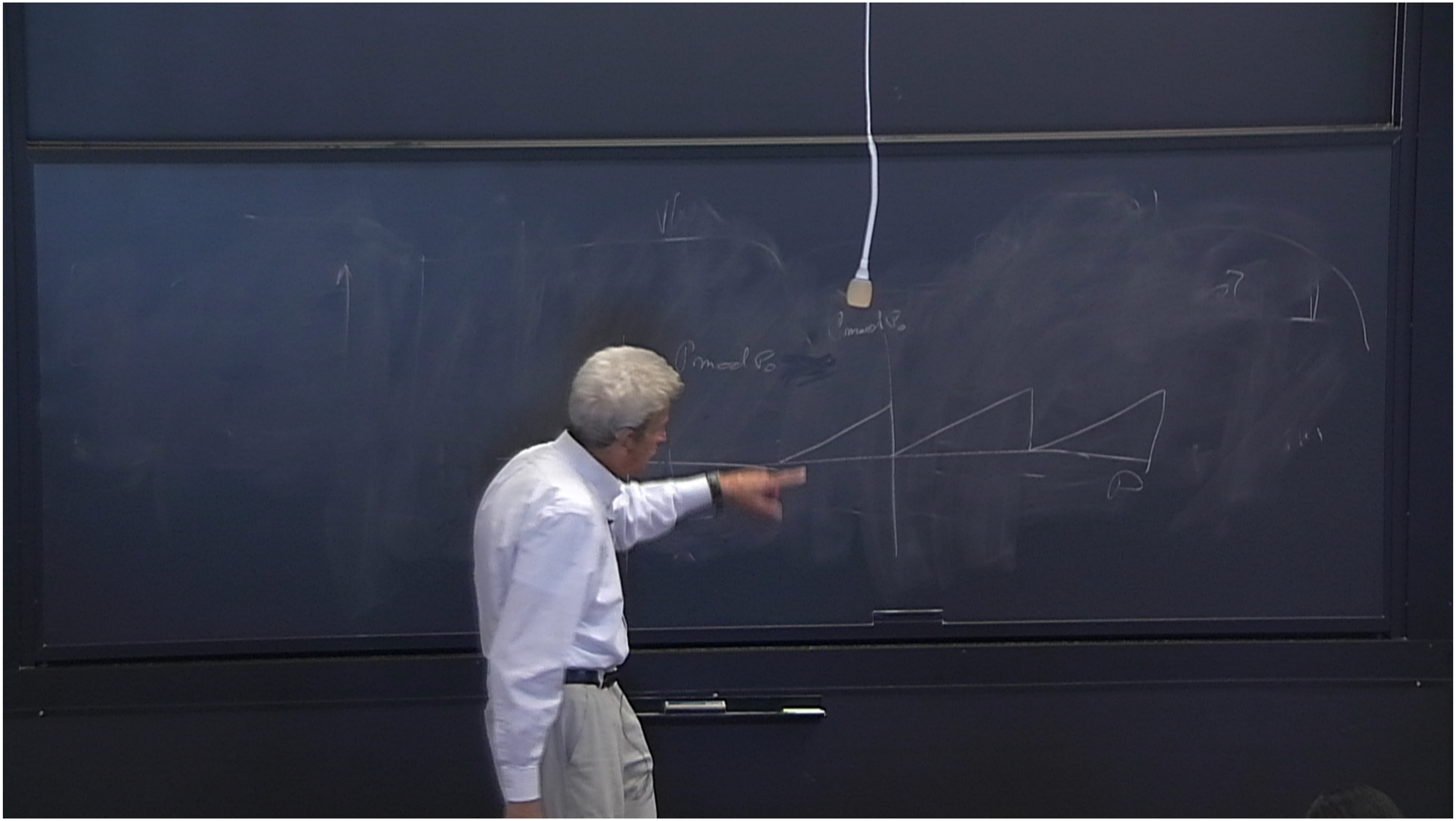


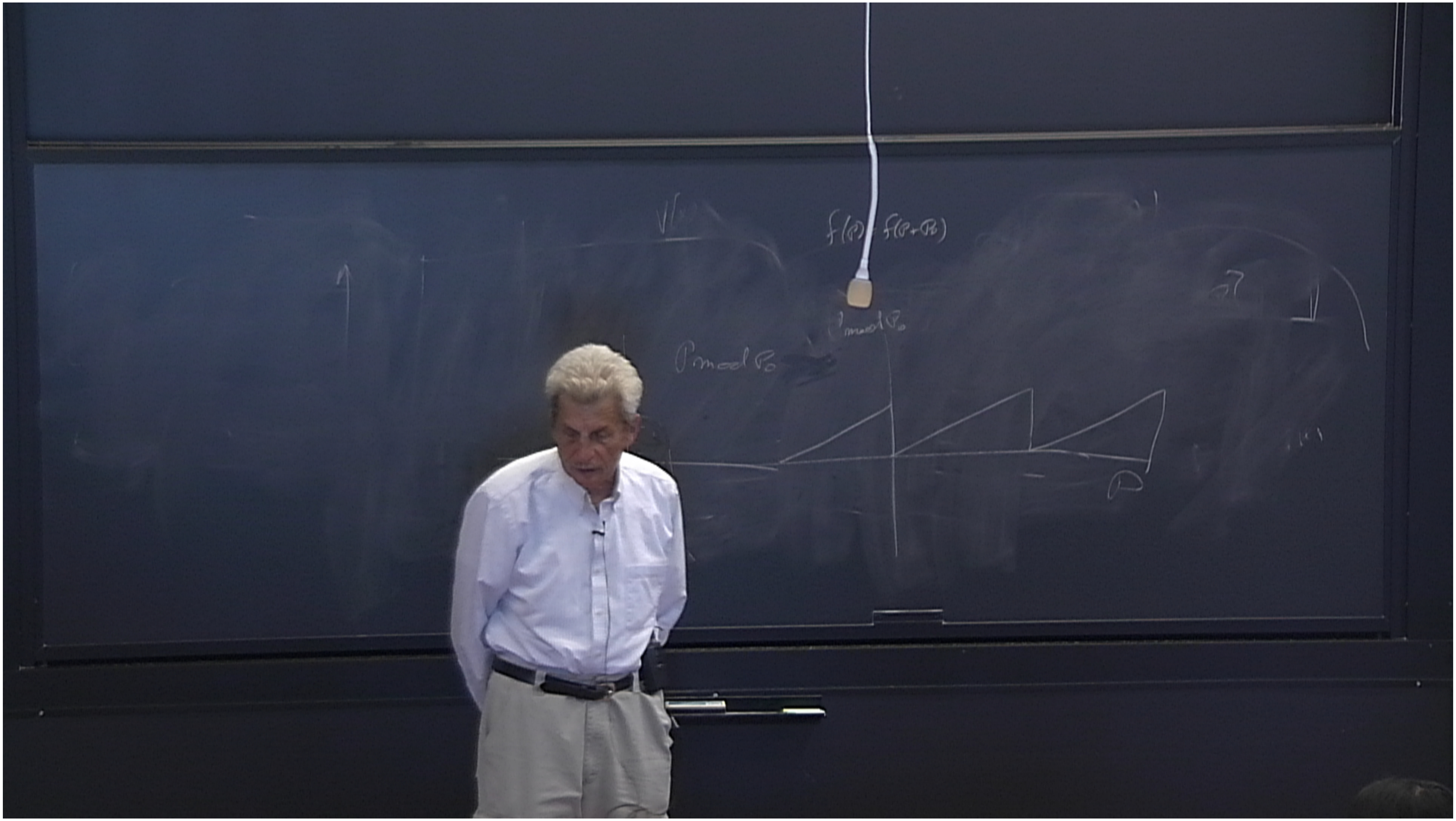




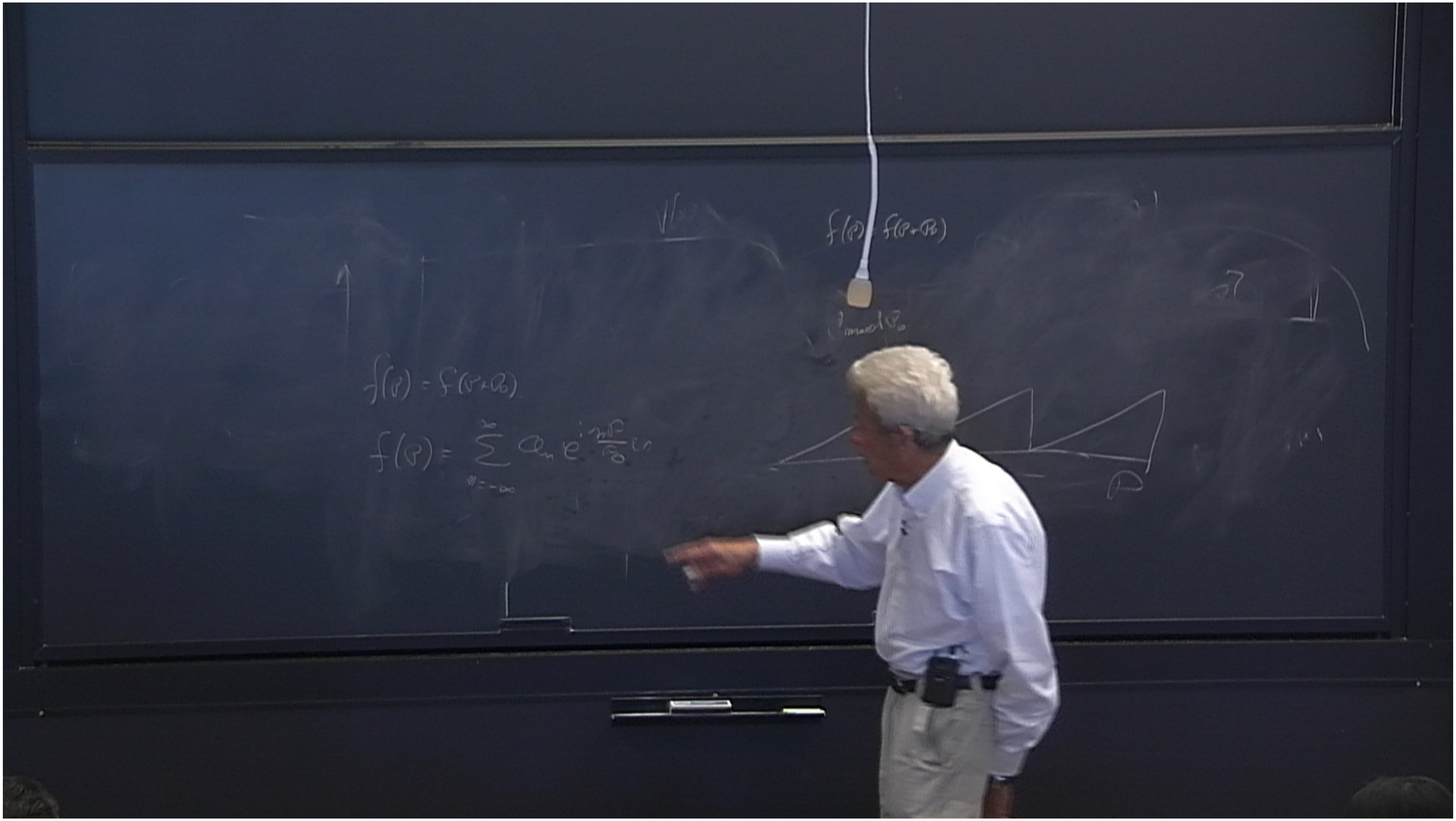




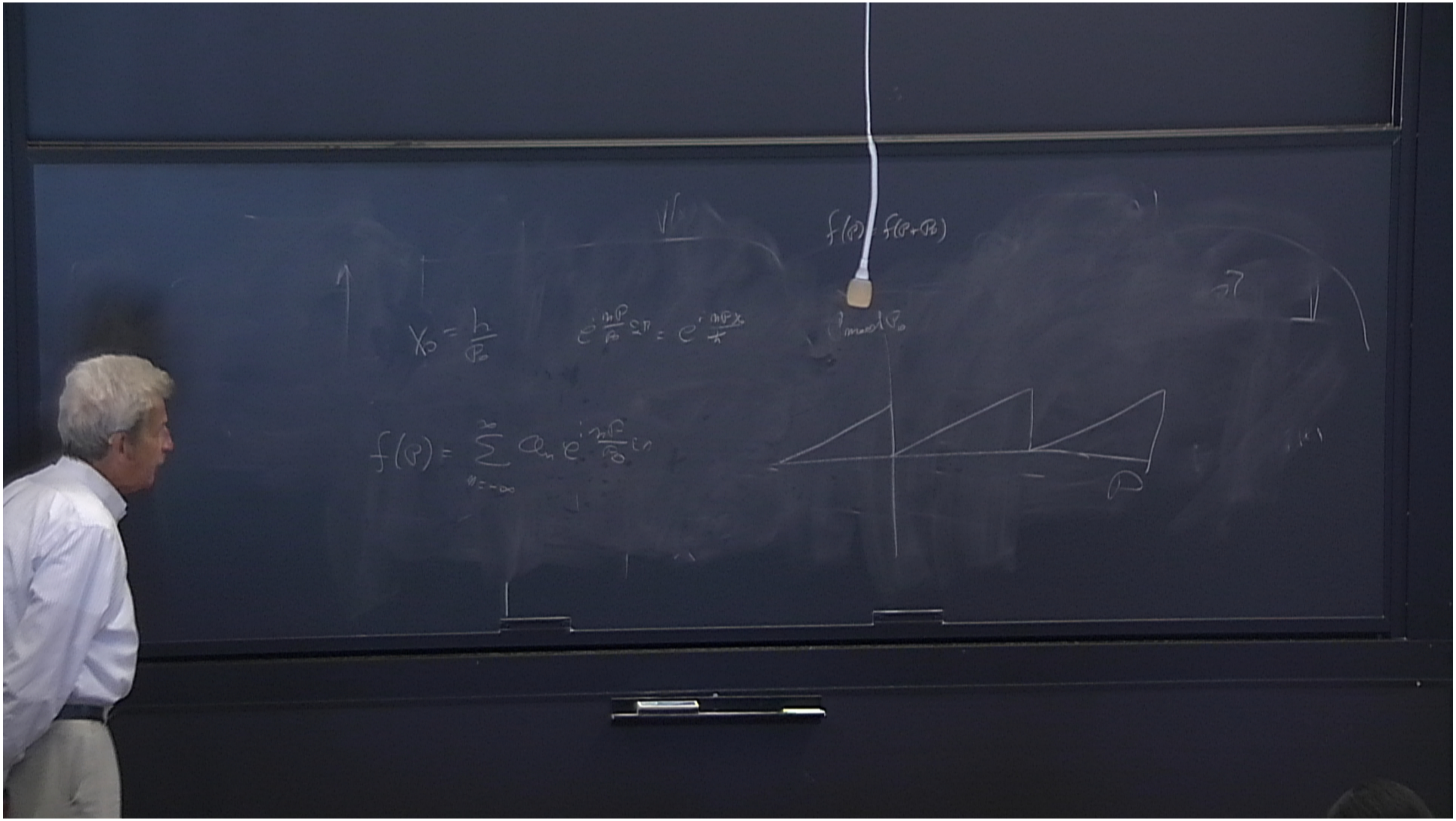

ρ mod ρ₀
ρ mod ρ₀
ρ

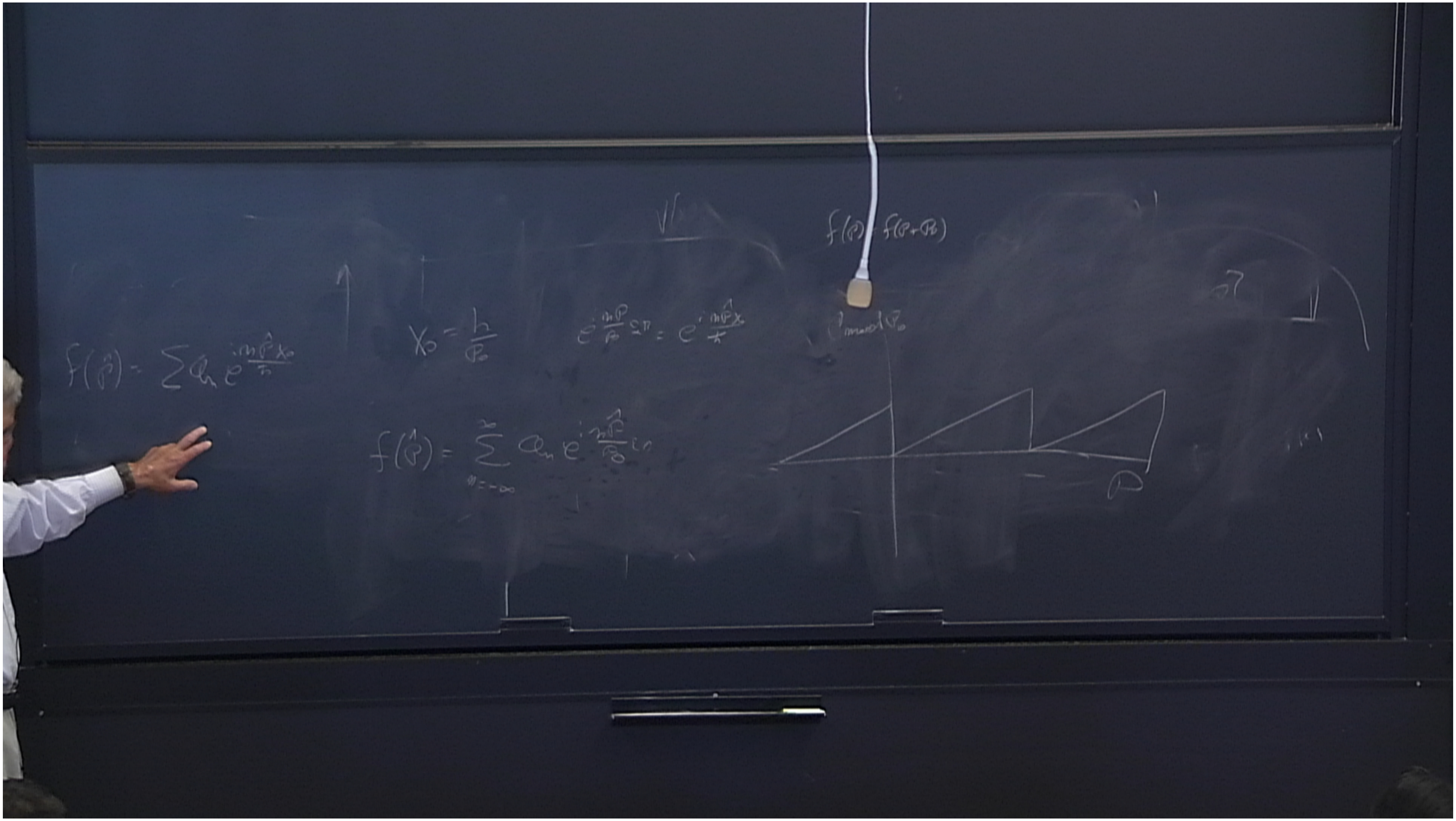


f(p) = f(p+p₀)
p mod p₀
p mod p₀

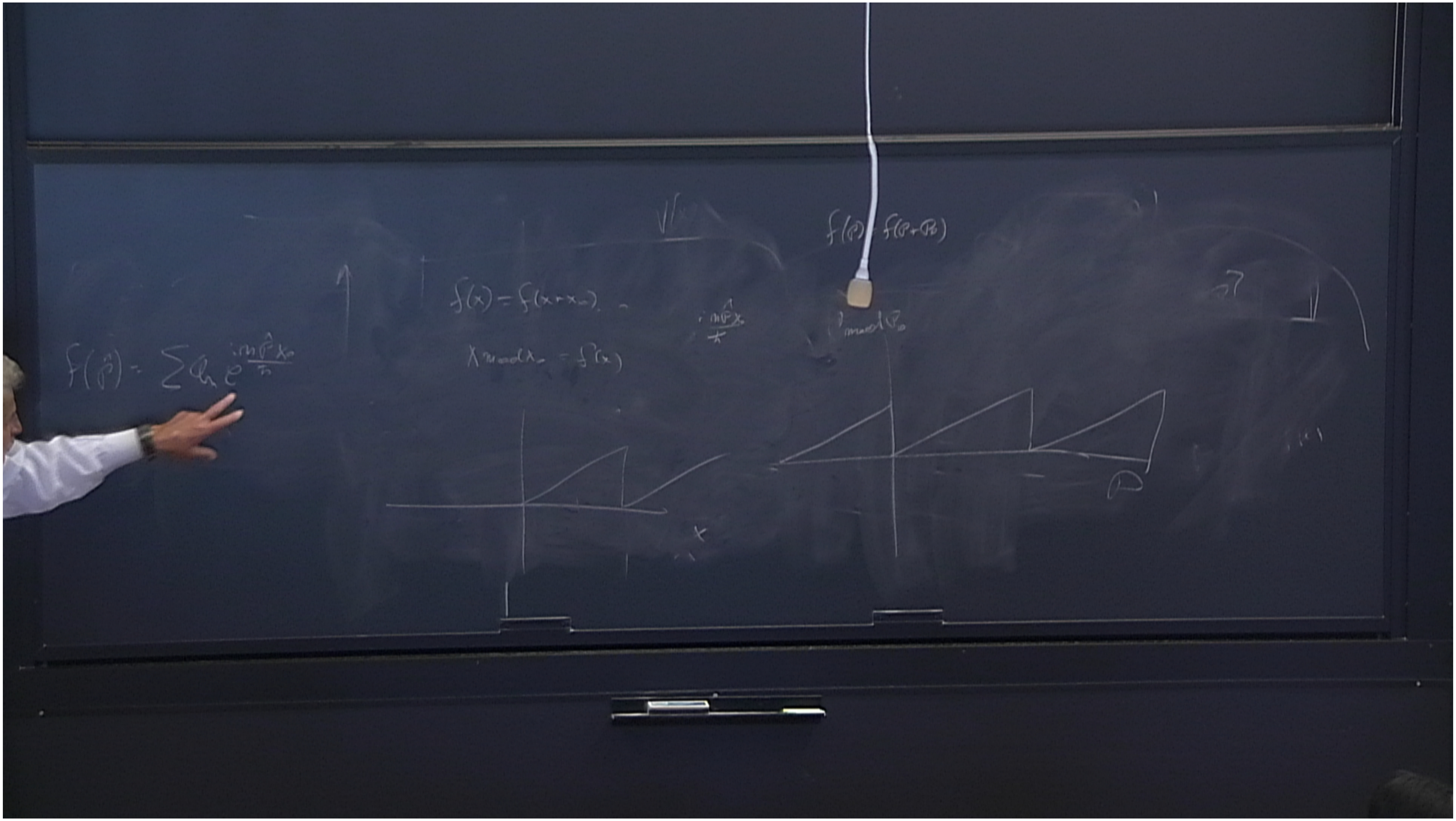


f(φ) = f(φ+φ₀)

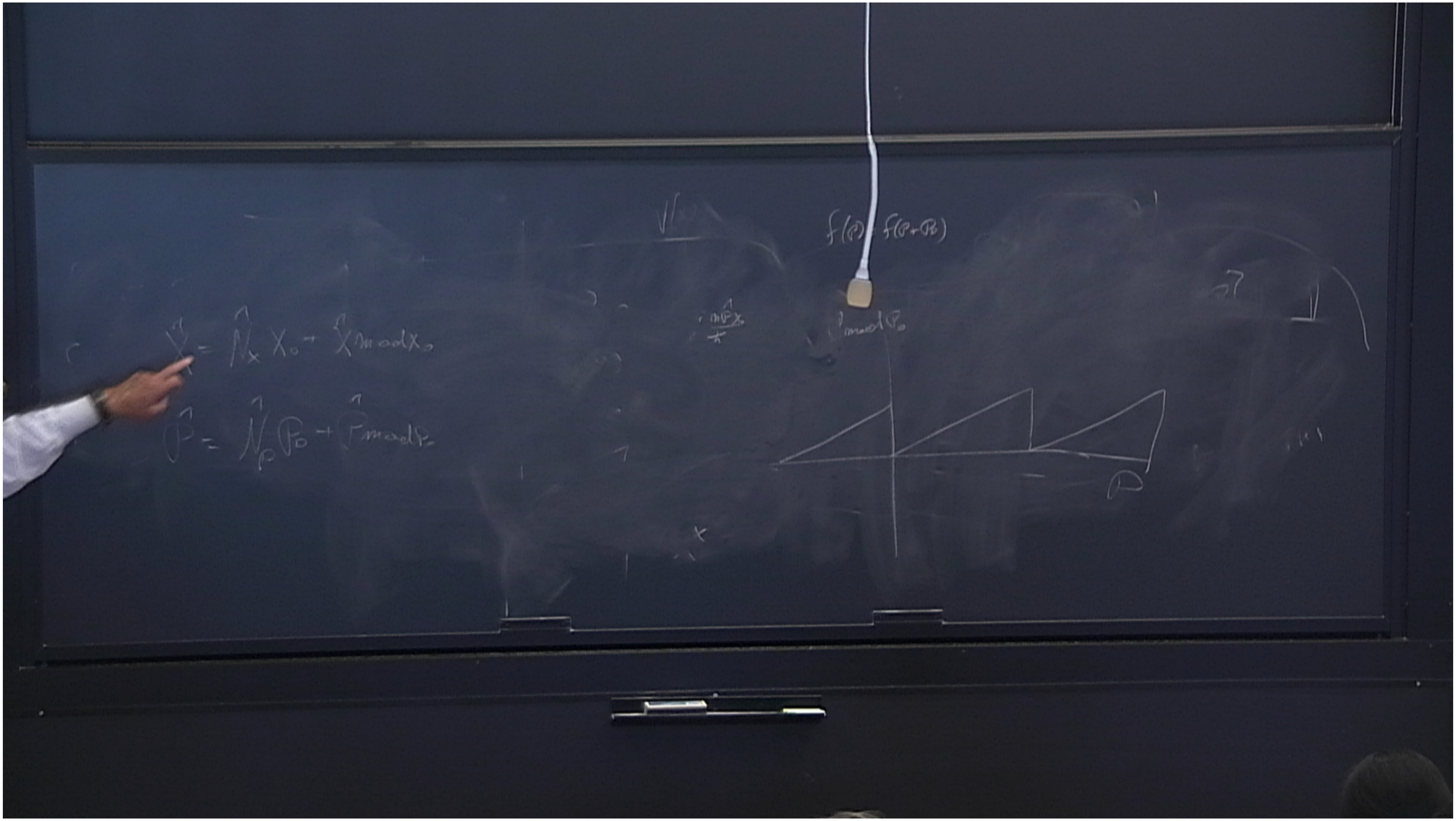

$x_0 = \frac{h}{p_0}$
$e^{i\frac{np}{p_0}2\pi} = e^{i\frac{np x}{\hbar}}$
$f(p) = f(p+p_0)$
$p \bmod p_0$
$f(p) = \sum_{n=-\infty}^{\infty} a_n e^{i\frac{np}{p_0}2\pi}$
$p$



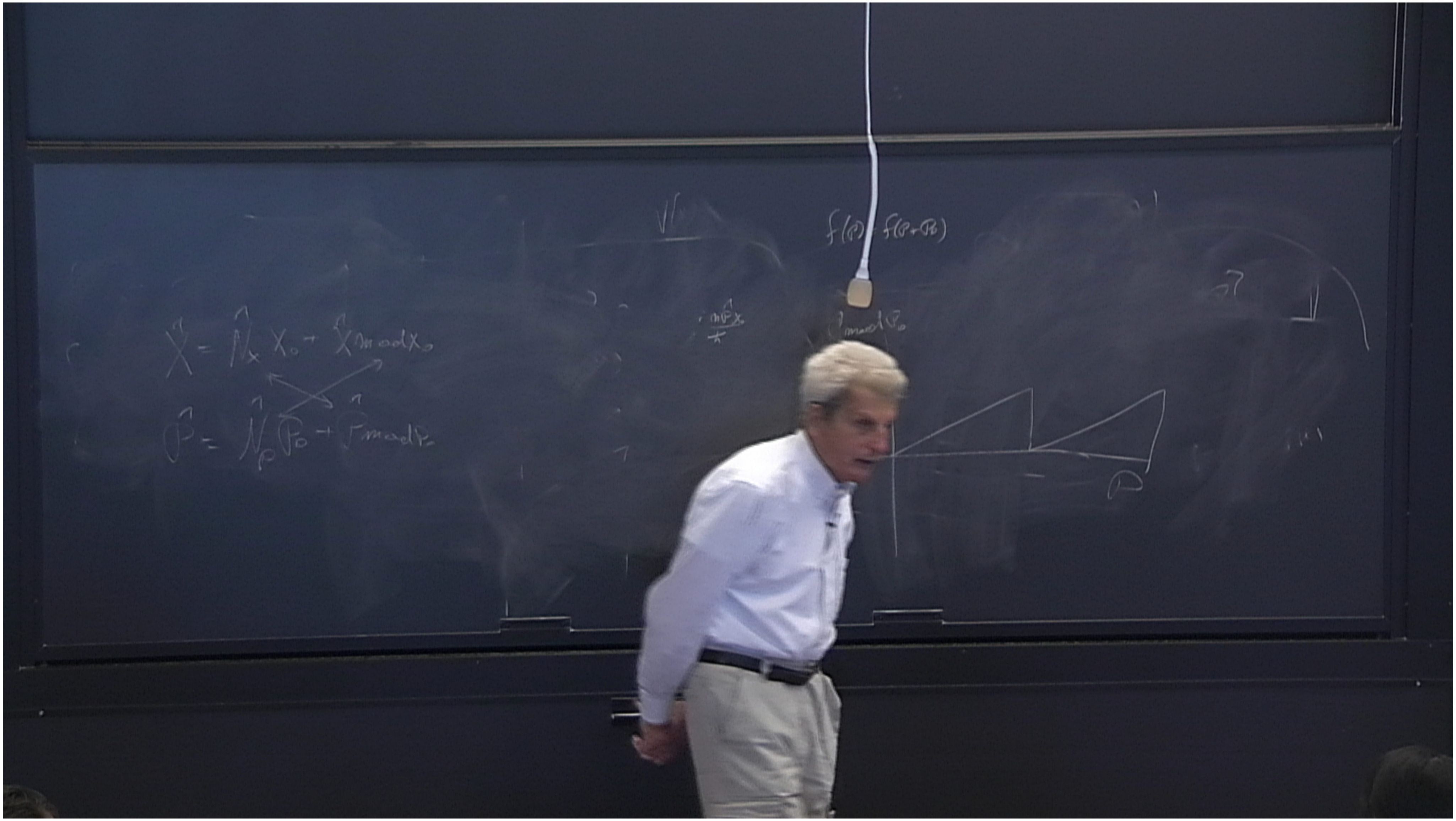
f(p) = f(p+p0)
x0 = h/p0
f(p) = Σ an e^(inp x0/ħ)

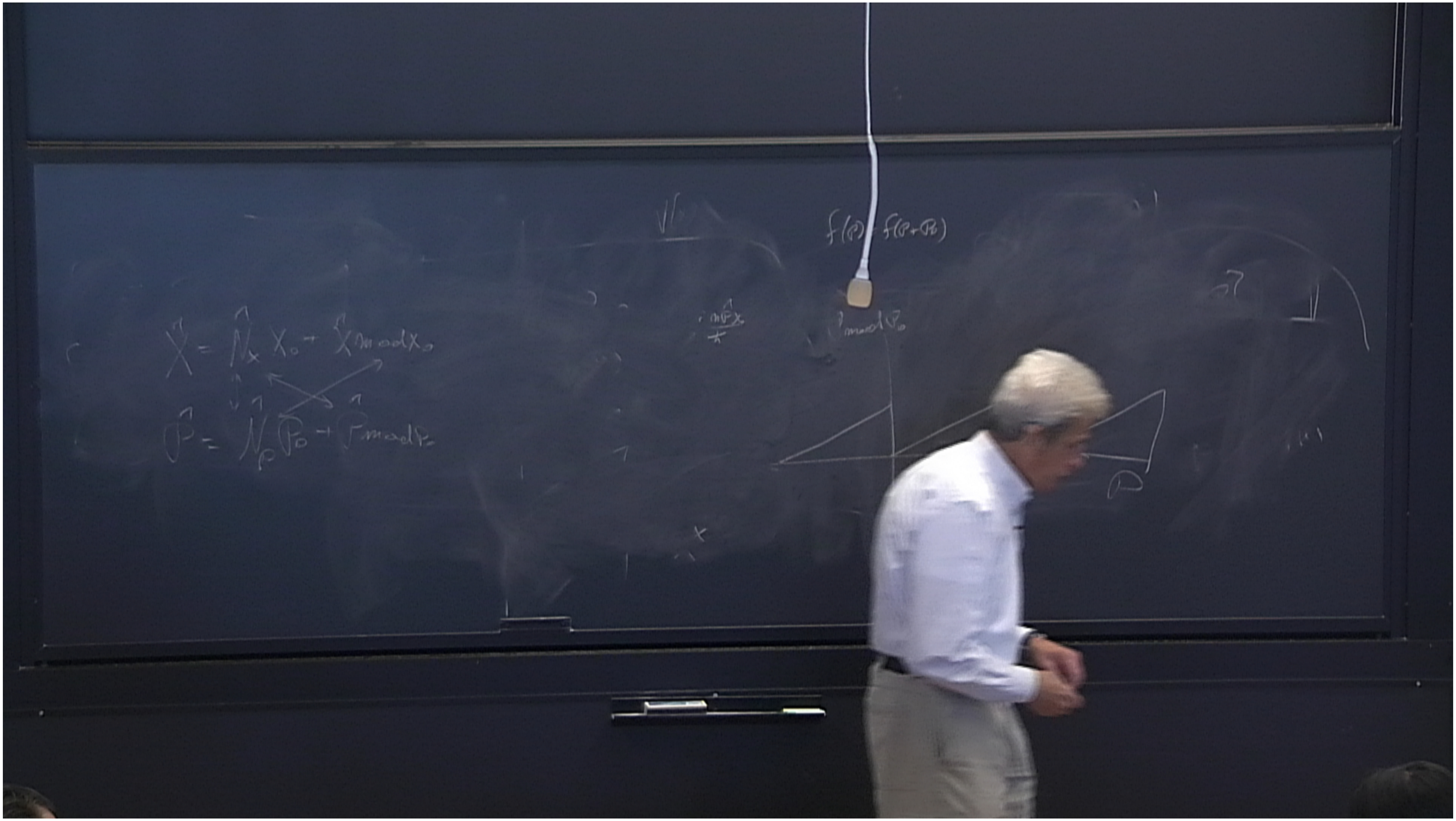


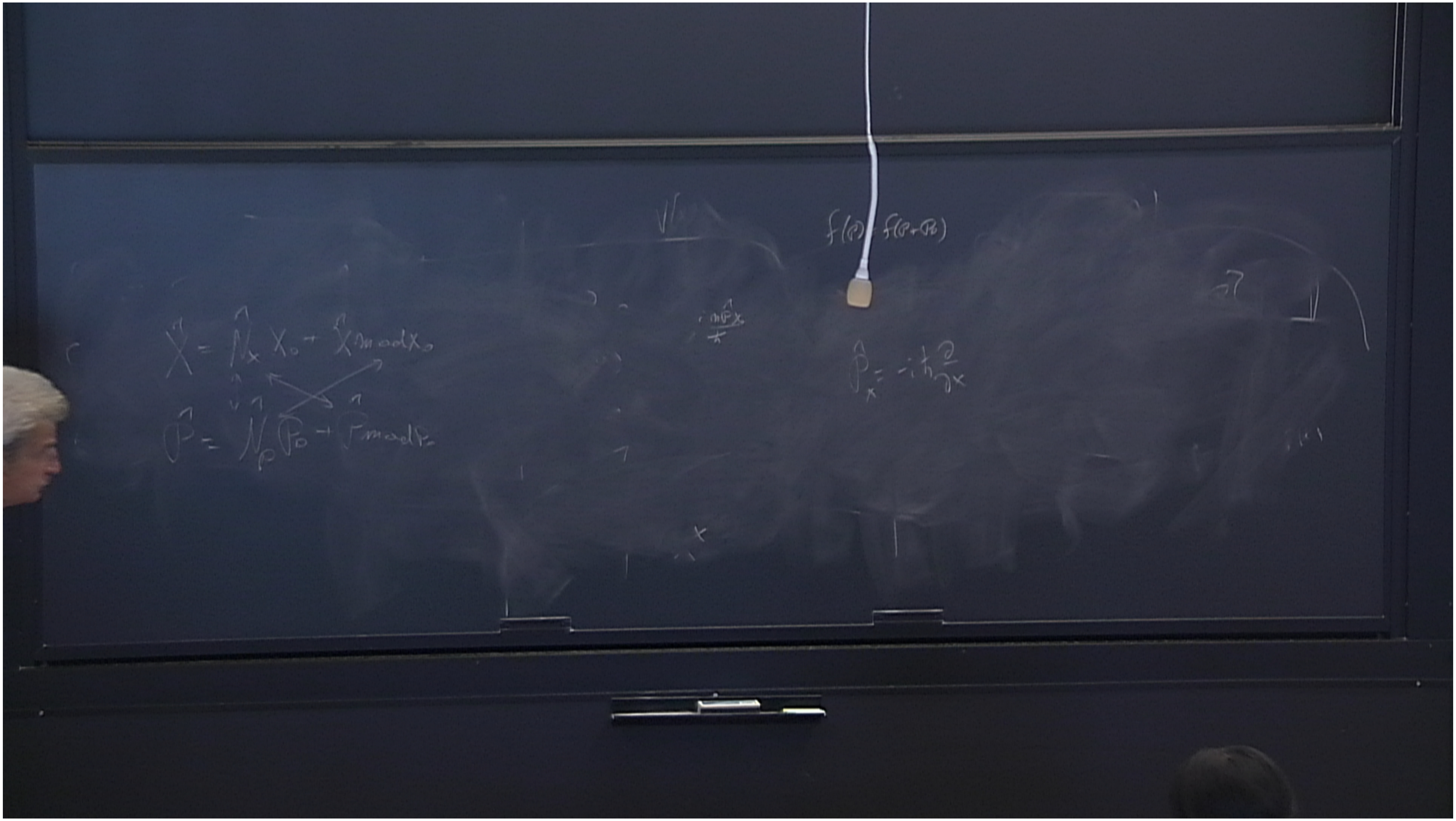
f(p̂) = Σ aₙ e^{imp̂x₀/ħ}
f(x) = f(x+x₀)
x mod x₀ = f(x)
f(p̂) = f(p+p₀)
p mod p₀

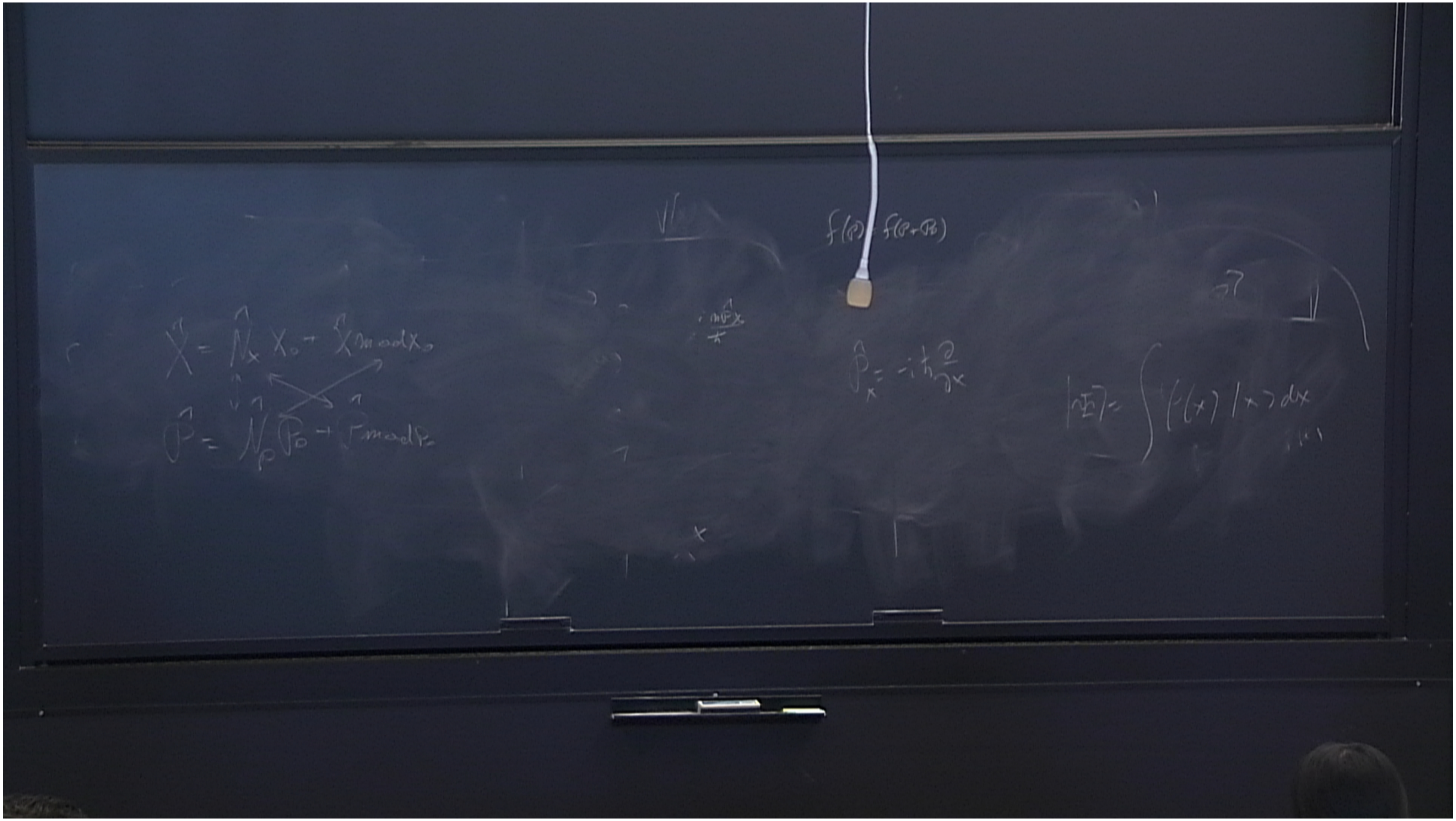


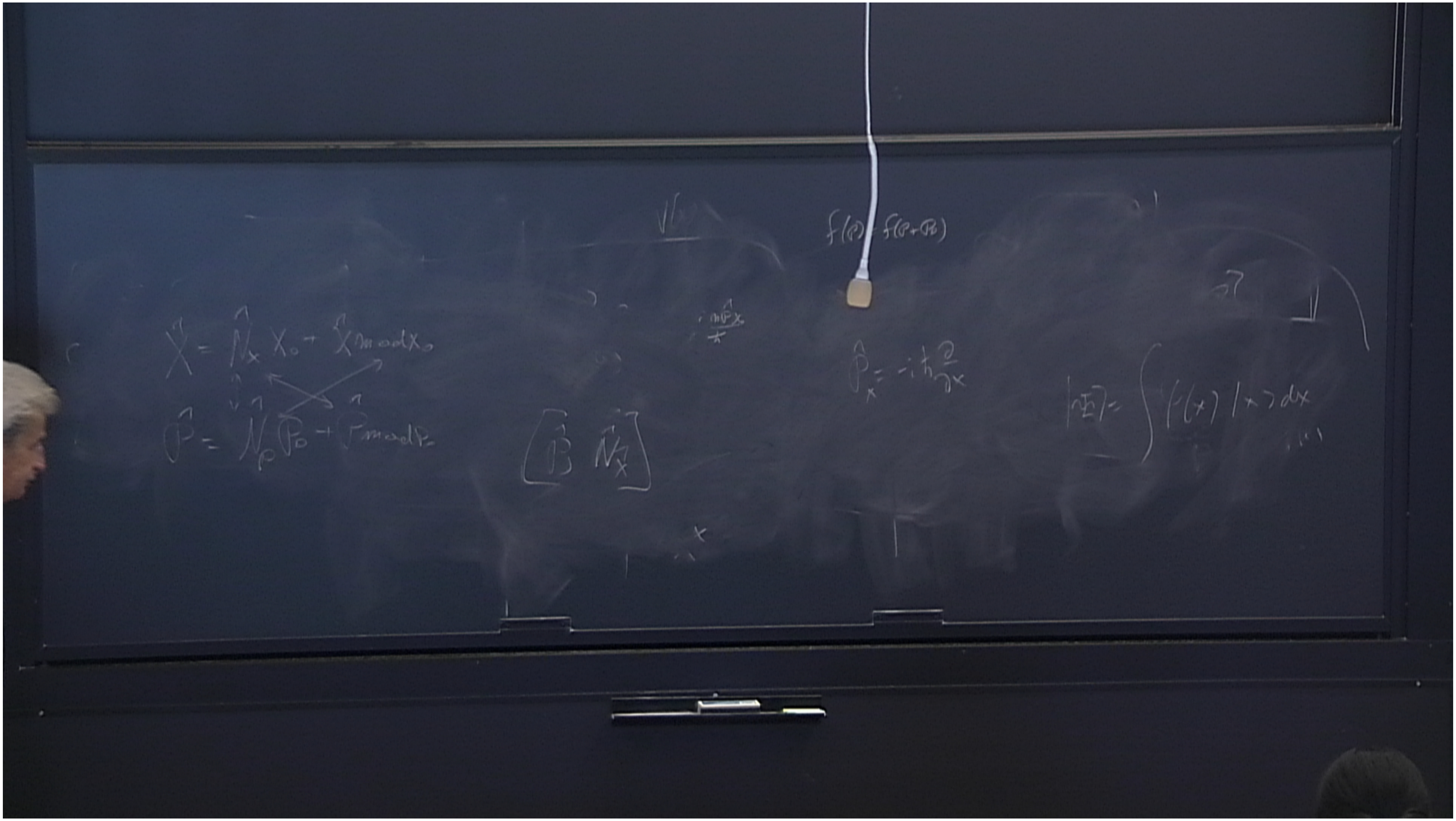
f(P) = f(P+P₀)
P mod P₀

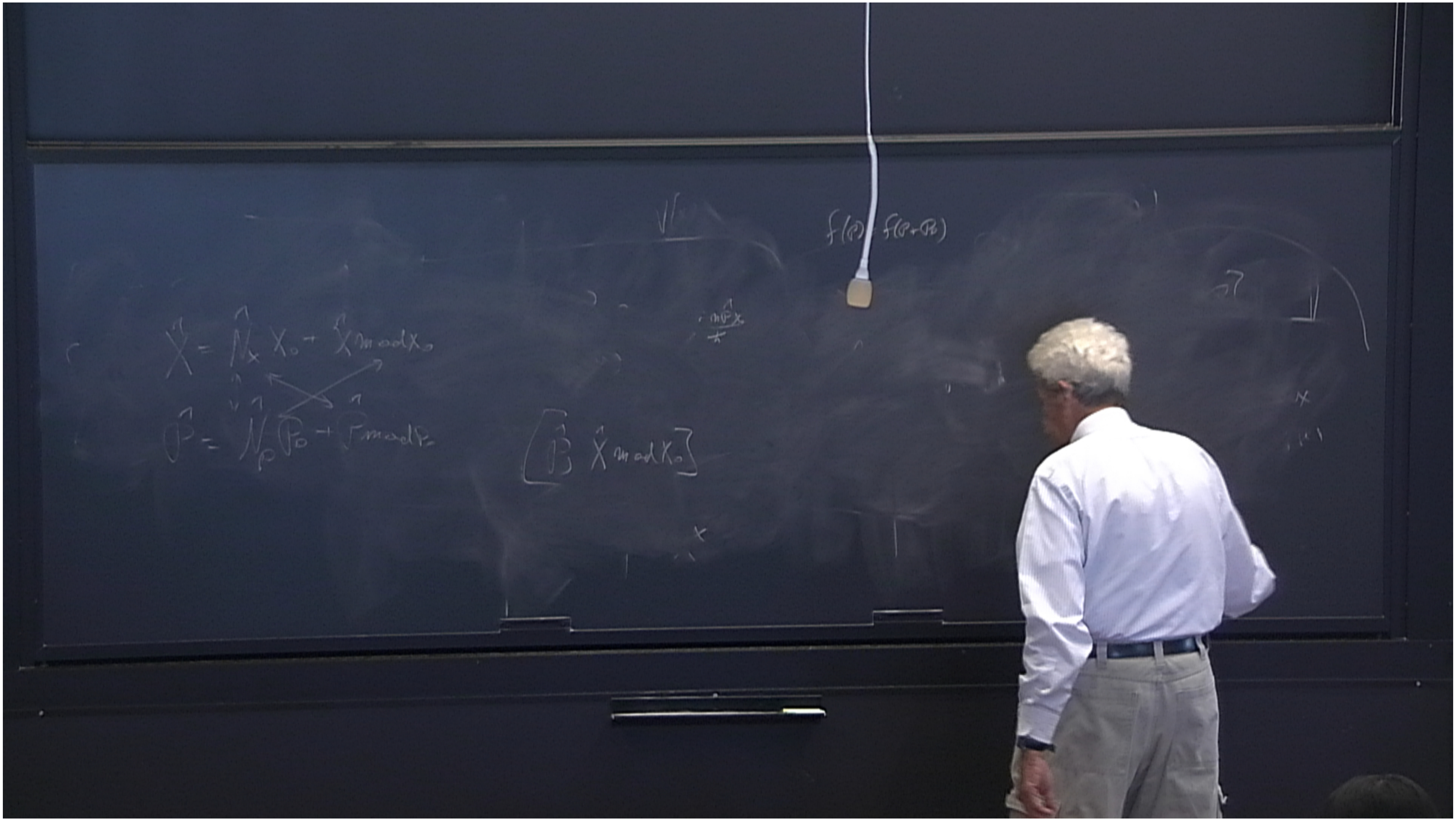

f(P) = f(P+P0)
X = Nx X0 + X mod X0
P = Np P0 + P mod P0
P mod P0

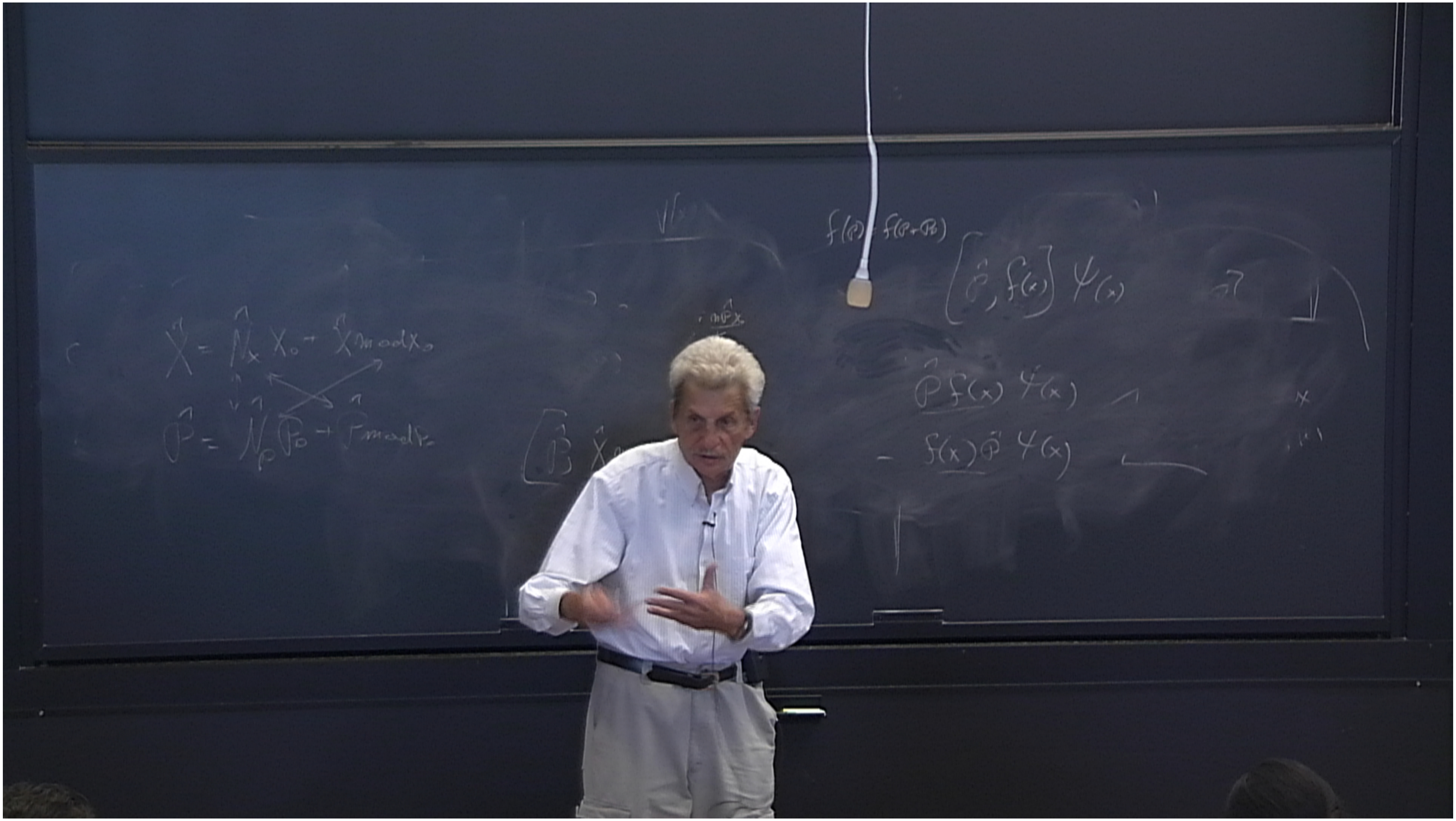

f(P) = f(P+P0)
P mod P0
X = Nx X0 + X mod X0
P = Np P0 + P mod P0

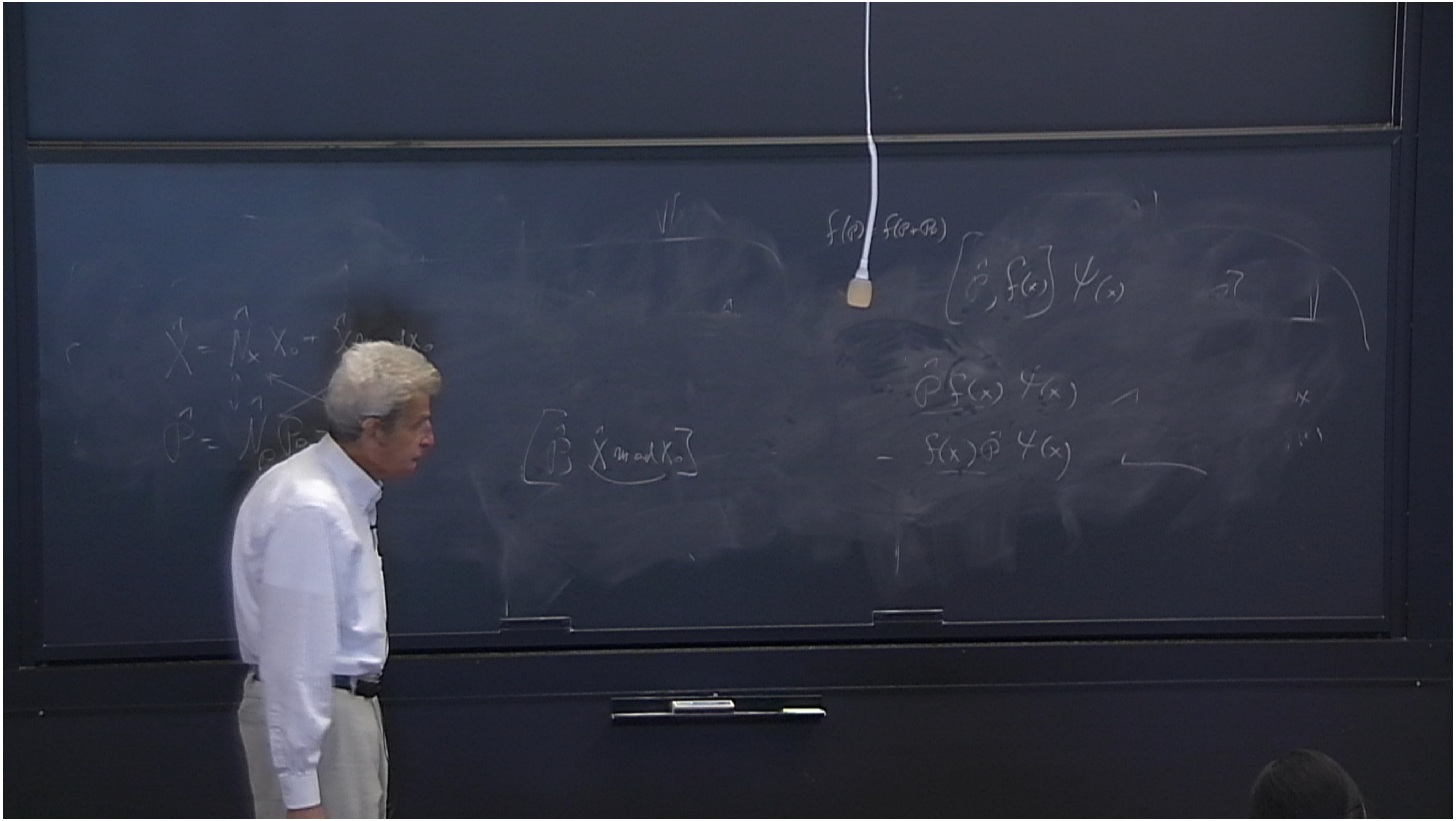

f(p) = f(p+p0)
X = Nx X0 + X mod X0
P = Np P0 + P mod P0
px = -iħ ∂/∂x

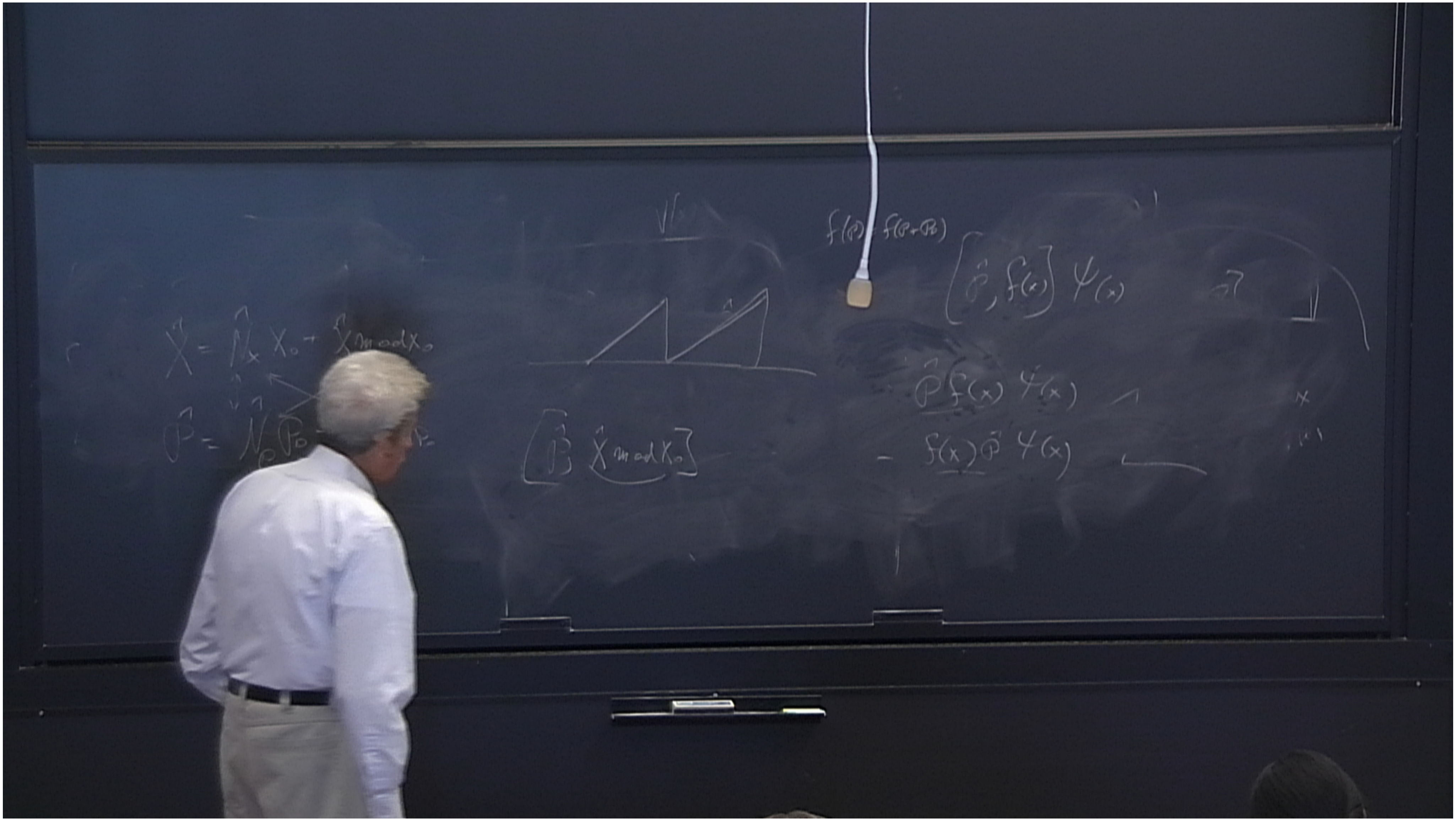

f(p) → f(p+p0)
X = Nx X0 + X mod X0
P = Np P0 + P mod P0
Px = -iħ ∂/∂x
|Ψ⟩ = ∫ ψ(x) |x⟩ dx

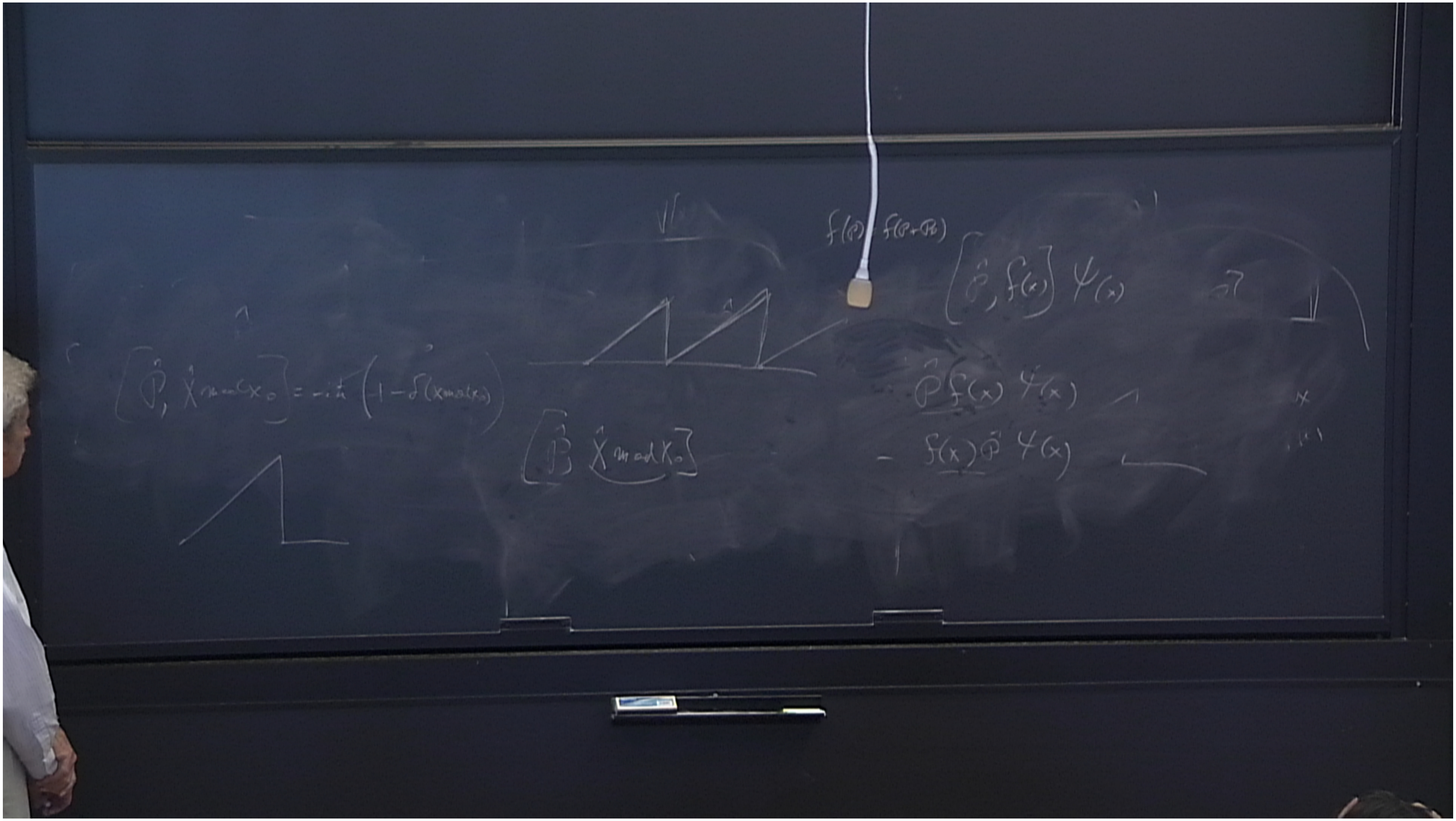


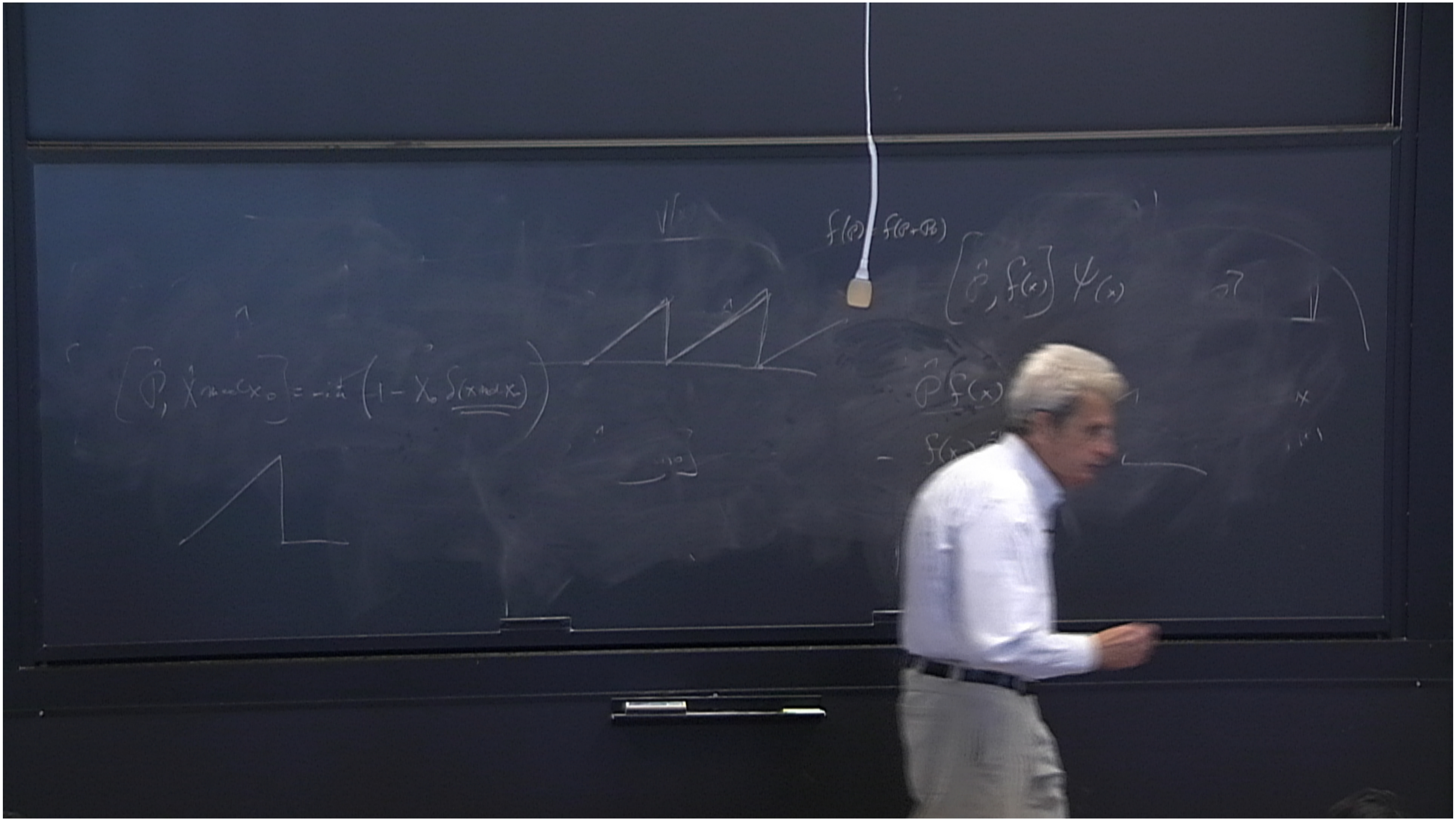


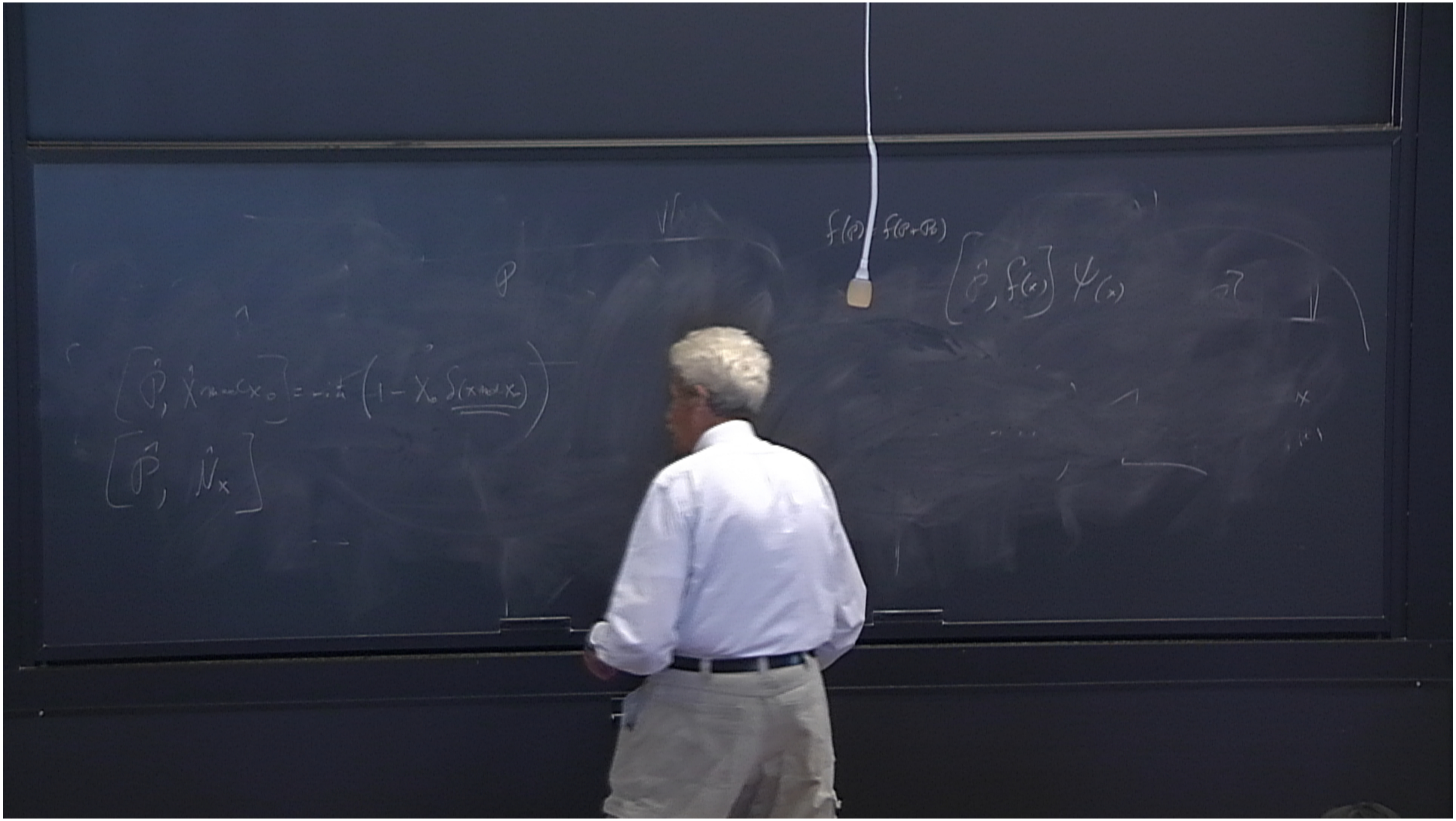


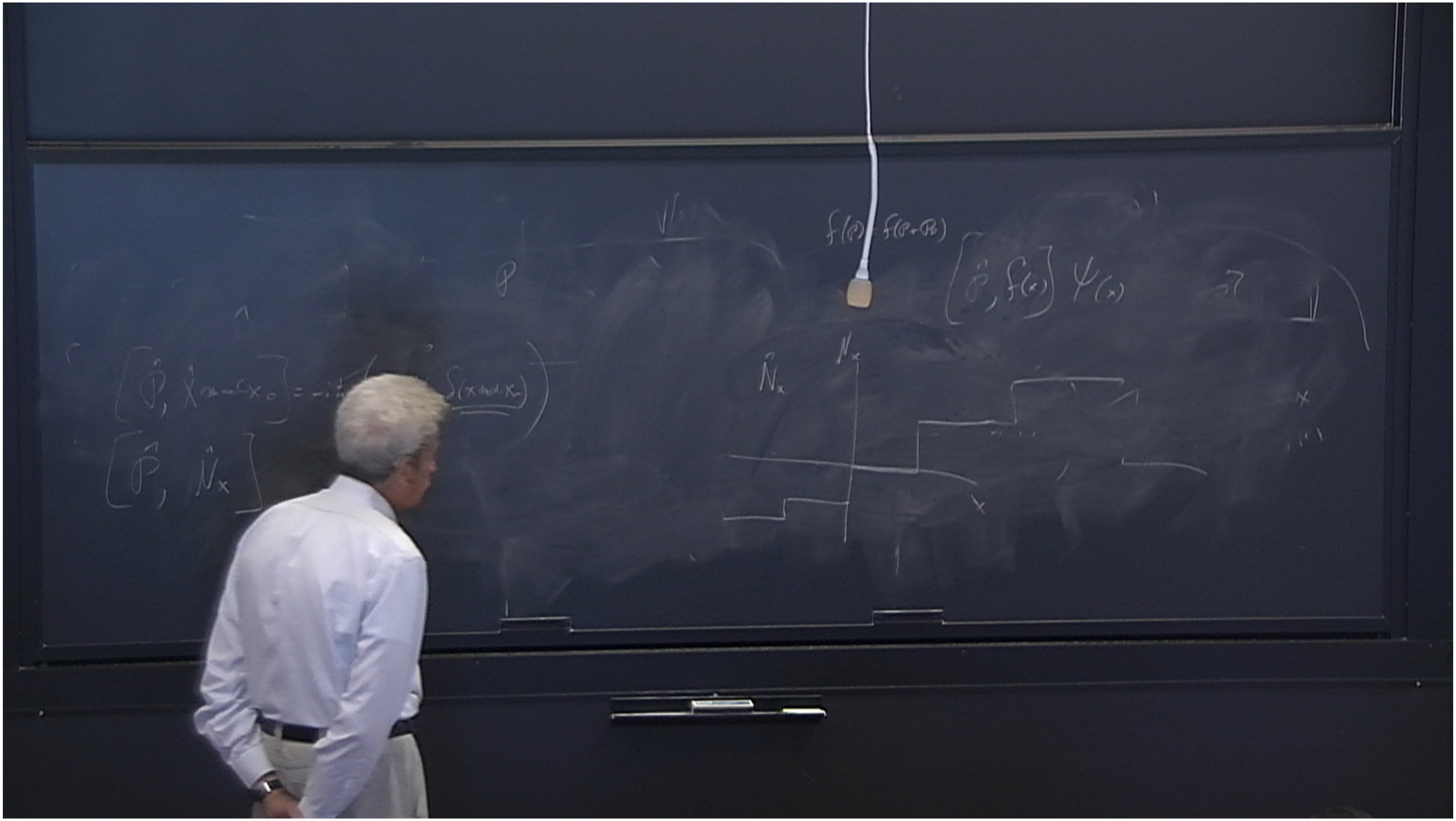


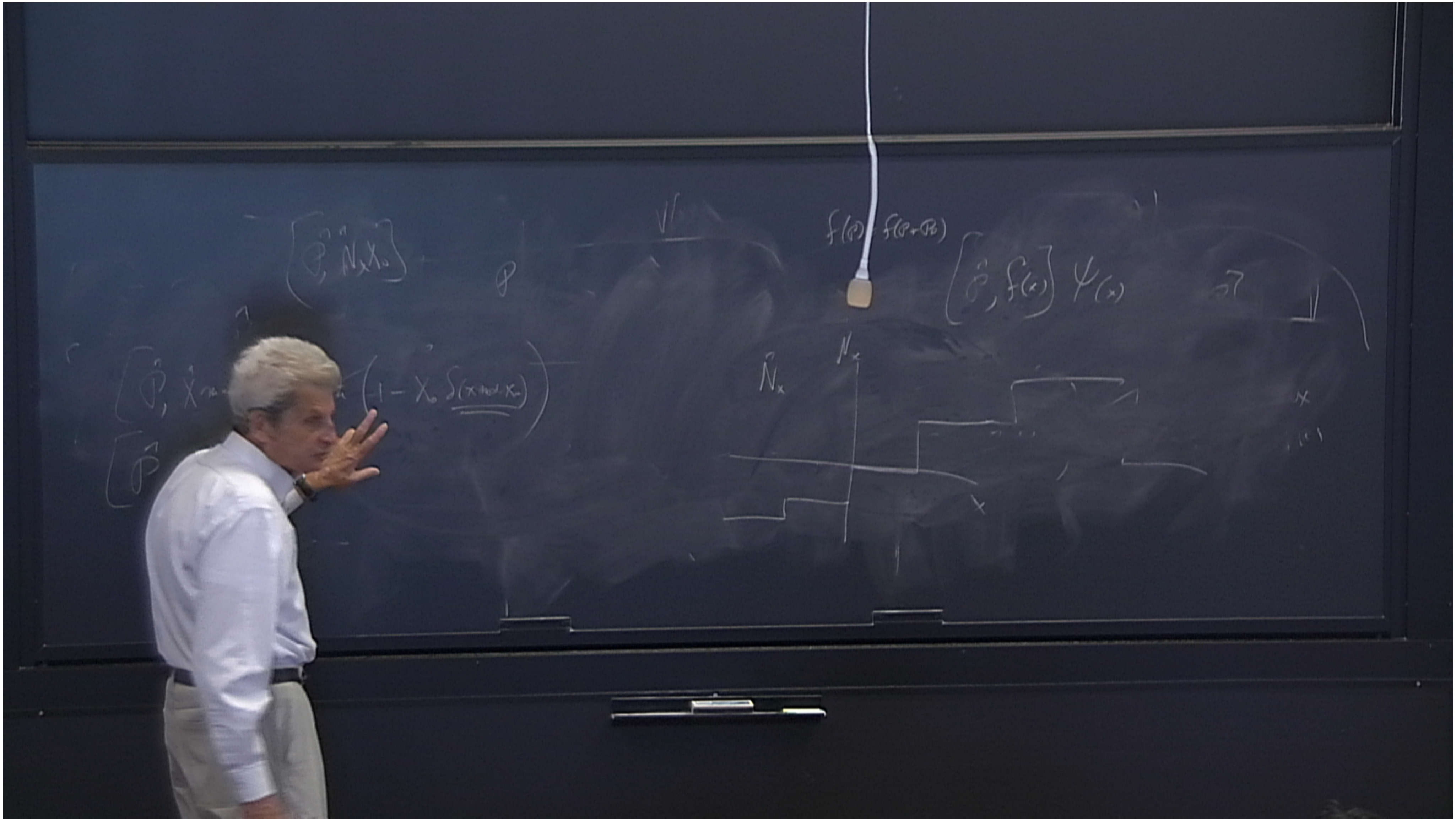


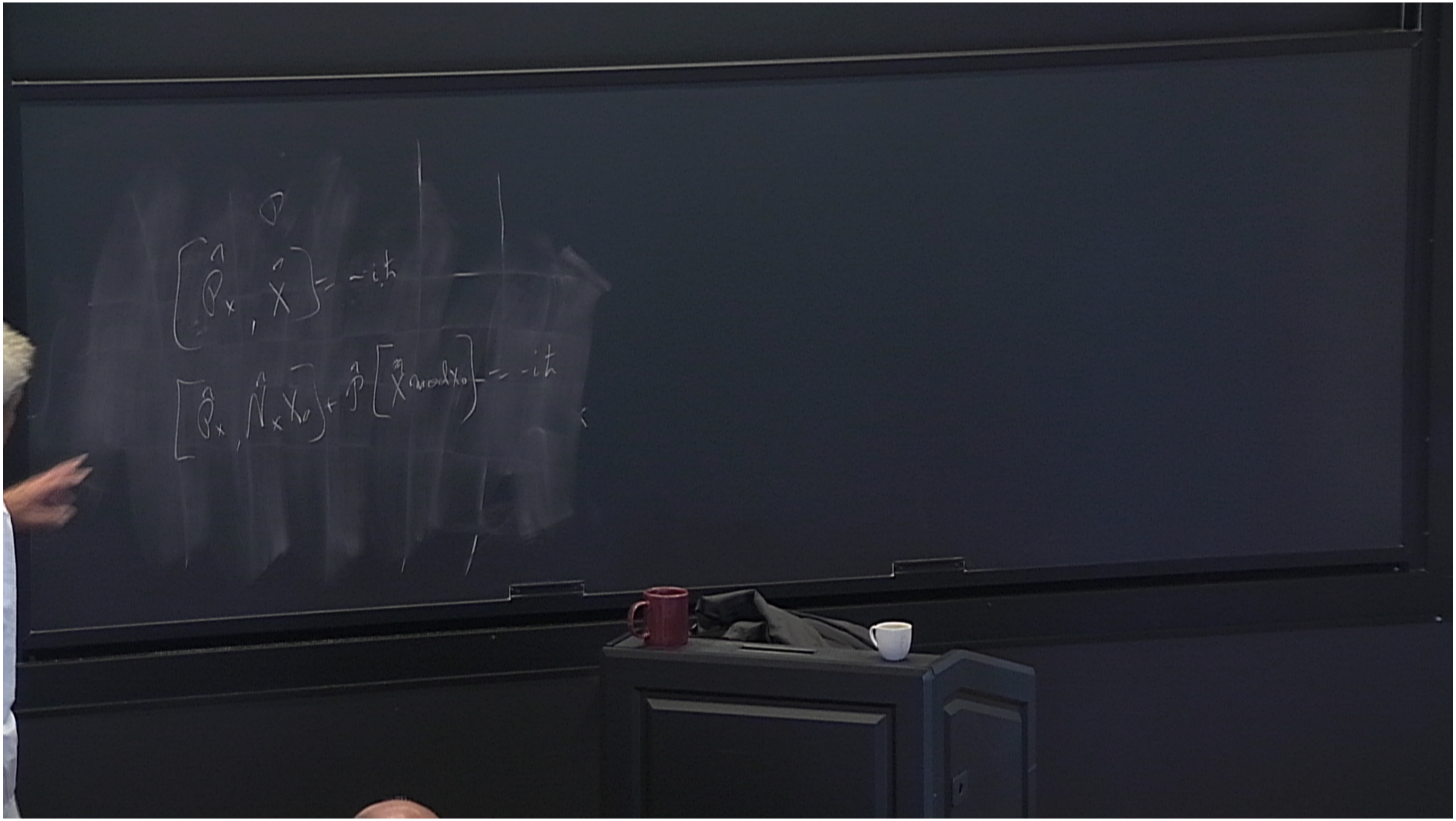

[P̂, X̂ mod x₀] = -iħ(1 - δ(x mod x₀))
[P̂, X̂ mod x₀]
[P̂, f(x)] ψ(x)
P̂ f(x) ψ(x)
- f(x) P̂ ψ(x)

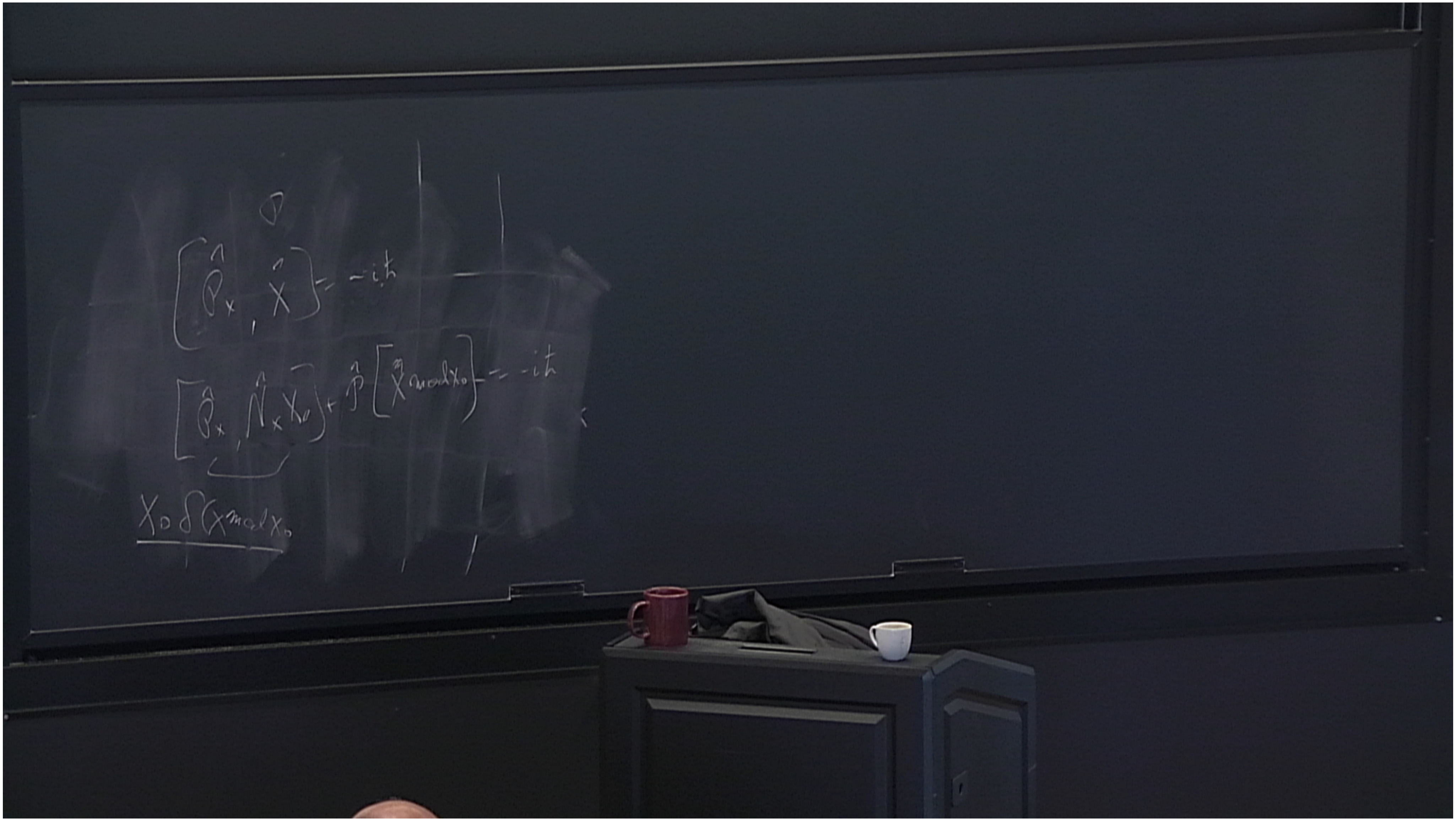









[$\hat{P}_x$ , $\hat{X}$] = -iħ


[P̂x , X̂] = -iħ
[P̂x , N̂x X0] + P̂ [X̂ mod X0] = -iħ
X0 δ(x mod X0