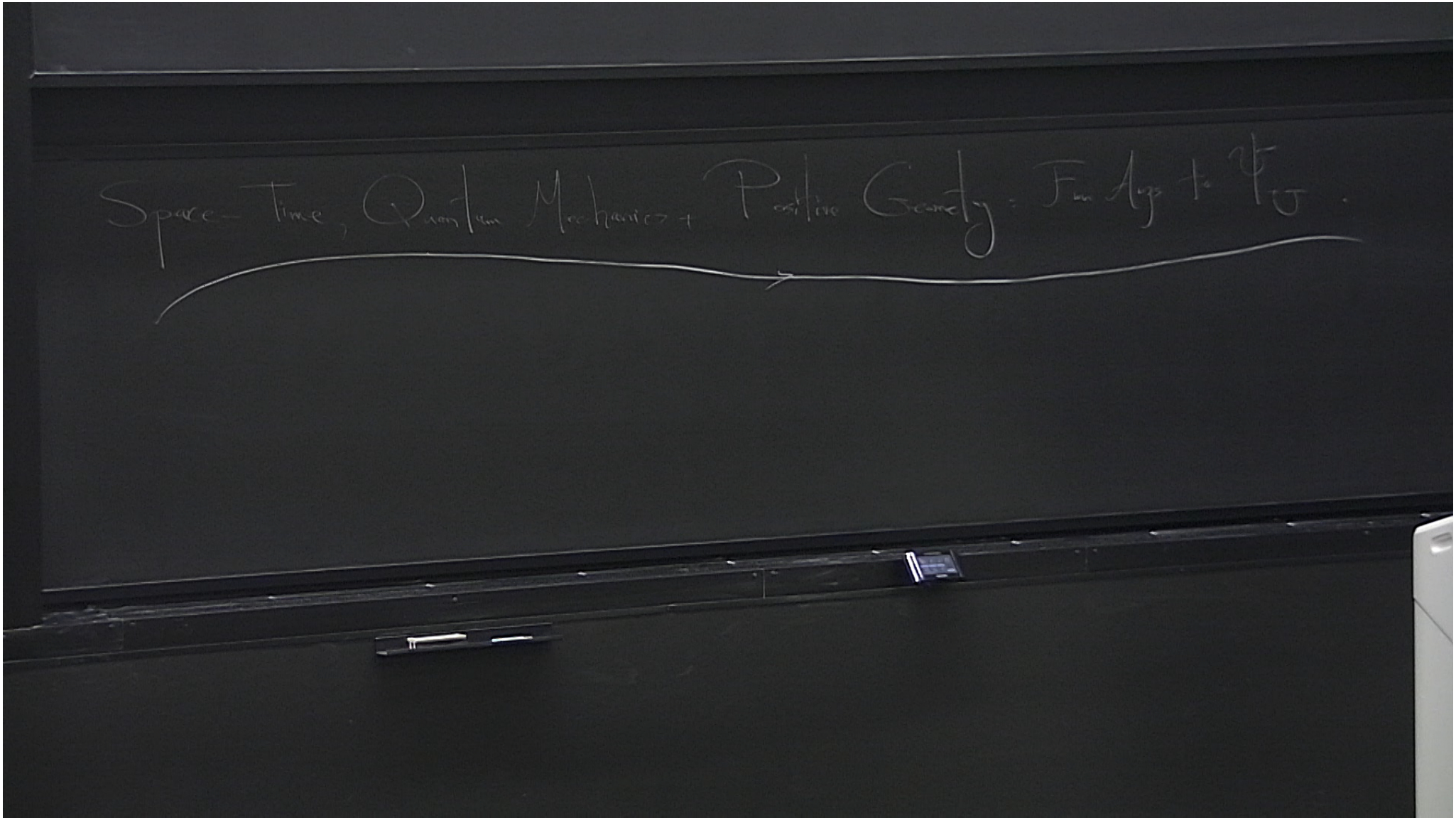
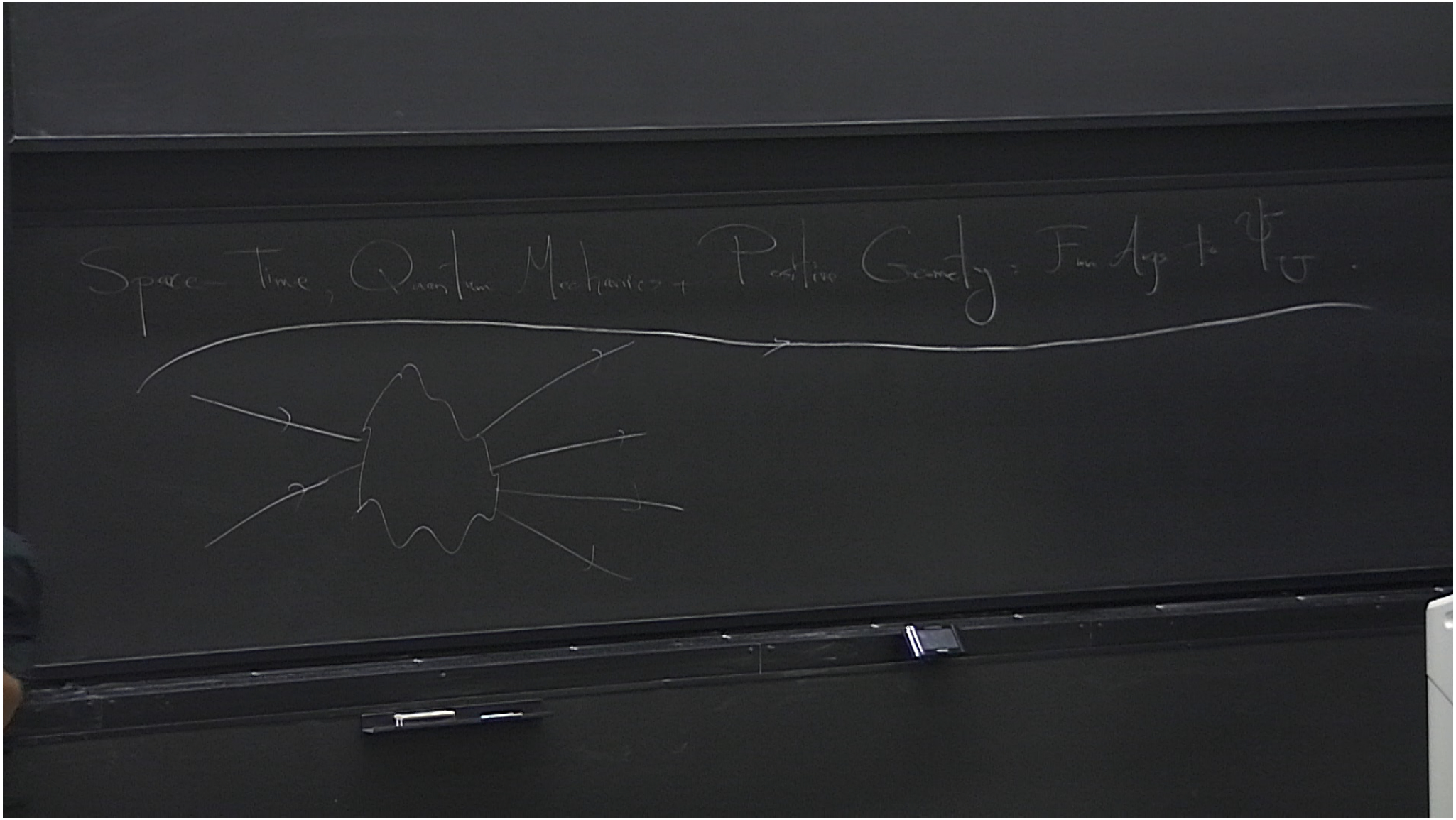
Title: PSI 2017/2018 - Scattering Amplitudes in QFT & String Theory - Lecture 10

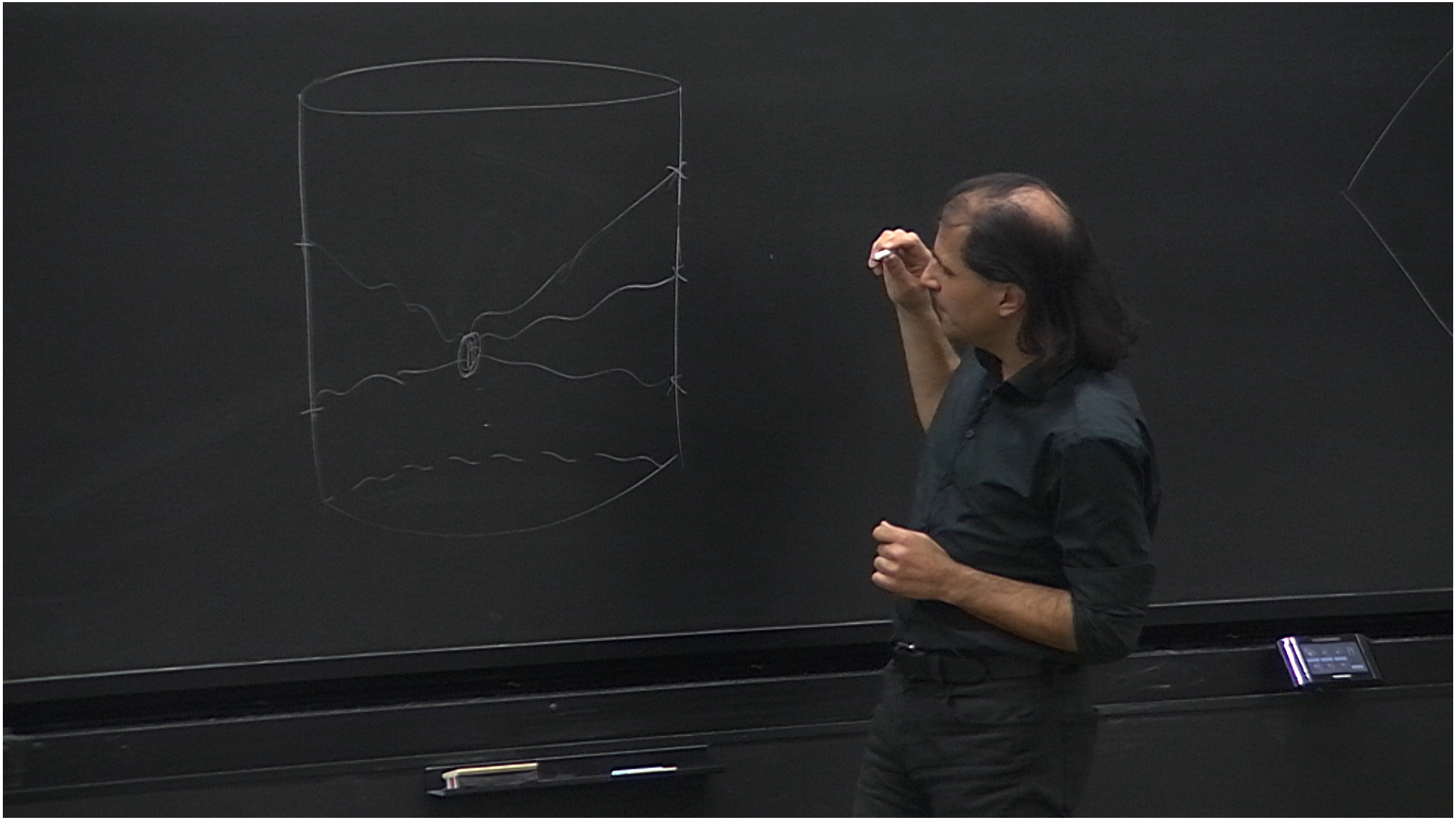
Date: Apr 19, 2018 11:30 AM

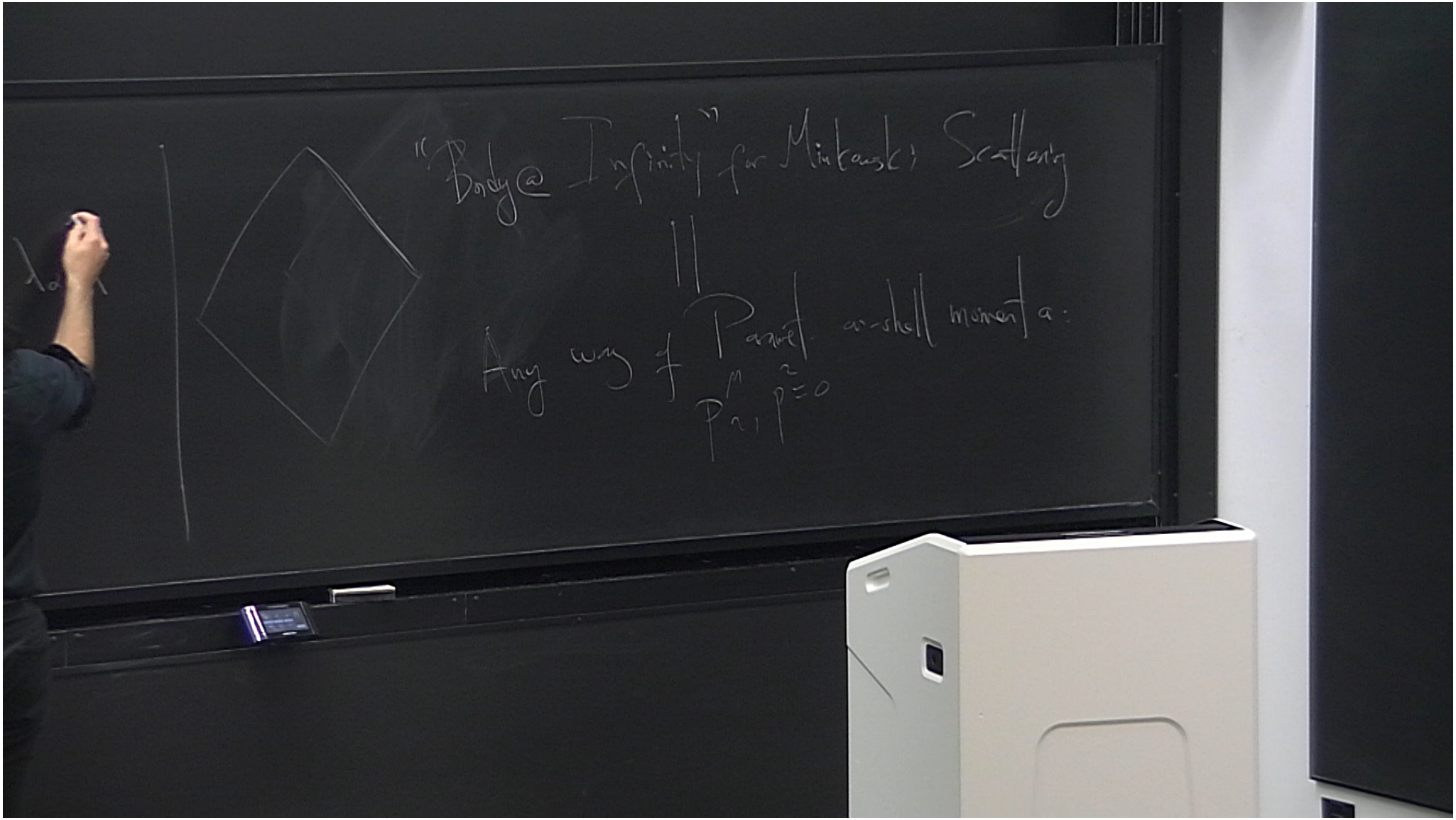
URL: http://pirsa.org/18040043

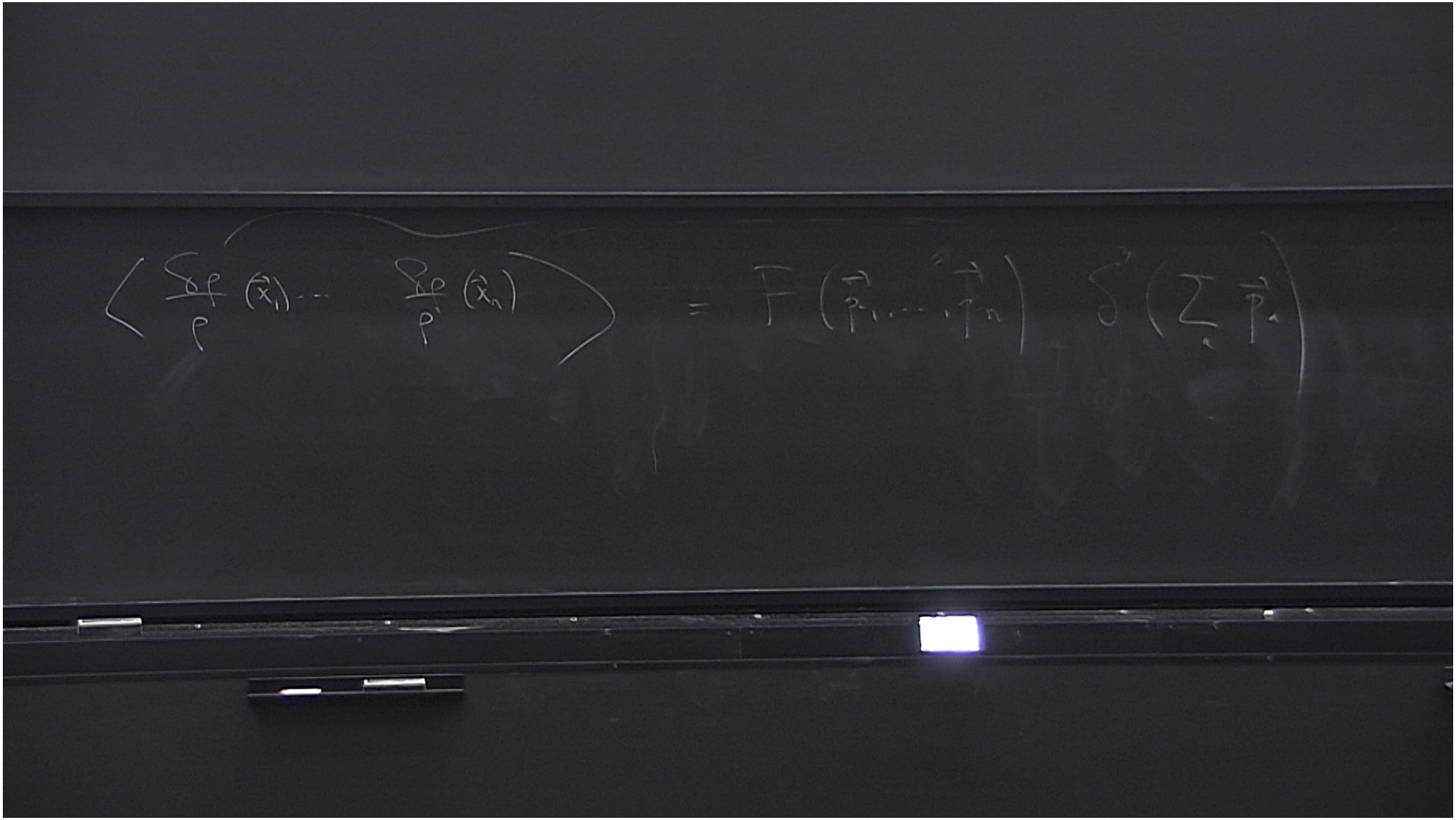
Abstract:


Space-Time, Quantum Mechanics + Positive Geometry: Fun Alg + $\mathcal{U}_U$.

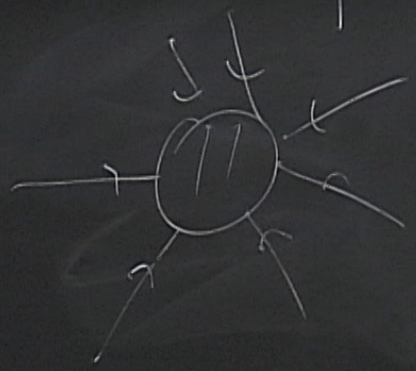

Space-Time, Quantum Mechanics + Positive Gravity: Fun Ahead!




"Body @ Infinity" for Minkowski Scattering
=
Any way of Parametrizing on-shell momenta:
$p_1^\mu, p^2 = 0$


$\left\langle \frac{\delta\rho}{\rho}(\vec{x}_1) \cdots \frac{\delta\rho}{\rho}(\vec{x}_n) \right\rangle = F(\vec{p}_1, \ldots, \vec{p}_n)\, \delta(\sum \vec{p}_i)$

Flat Space:



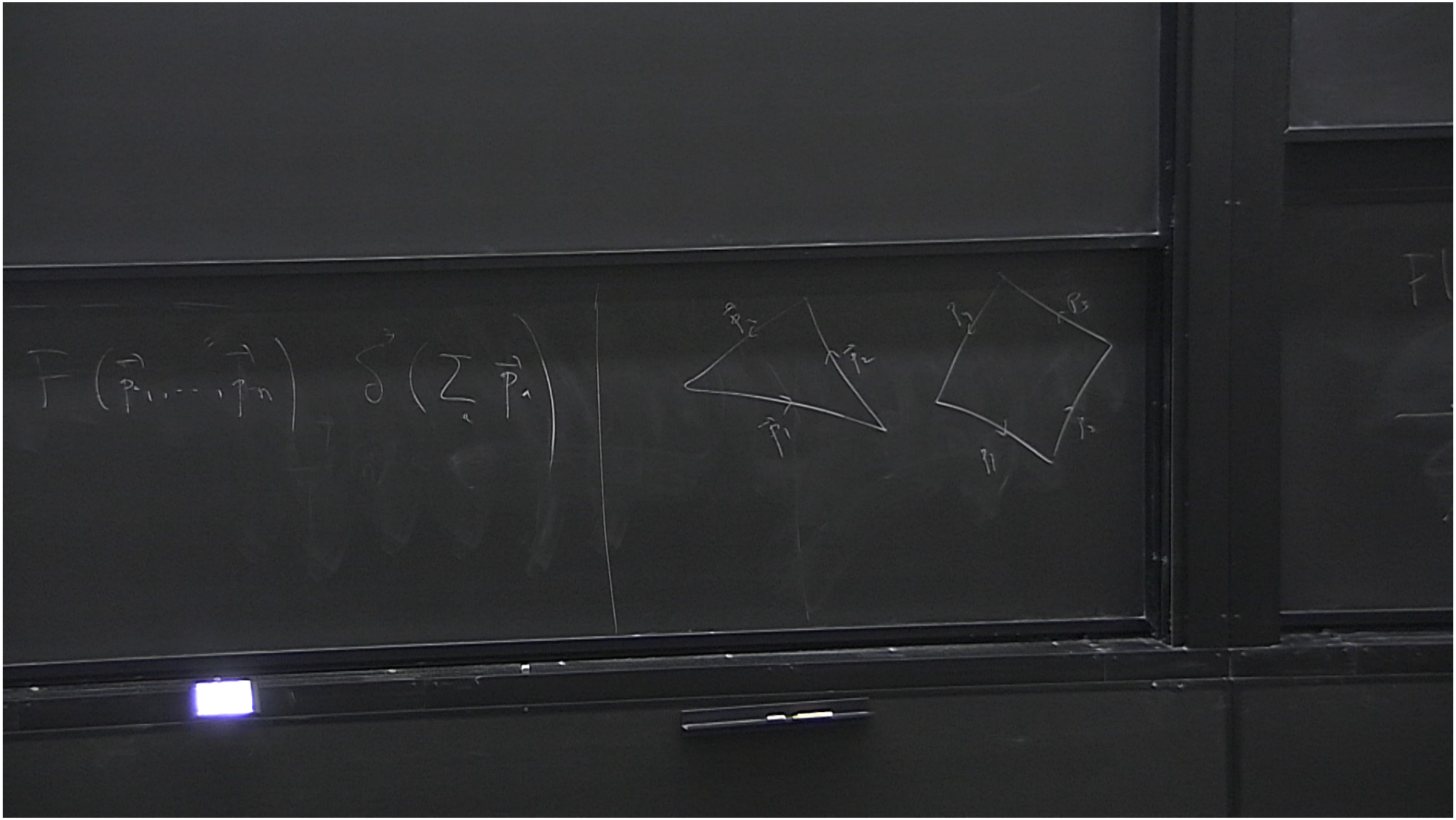
$M[p_i^r]$

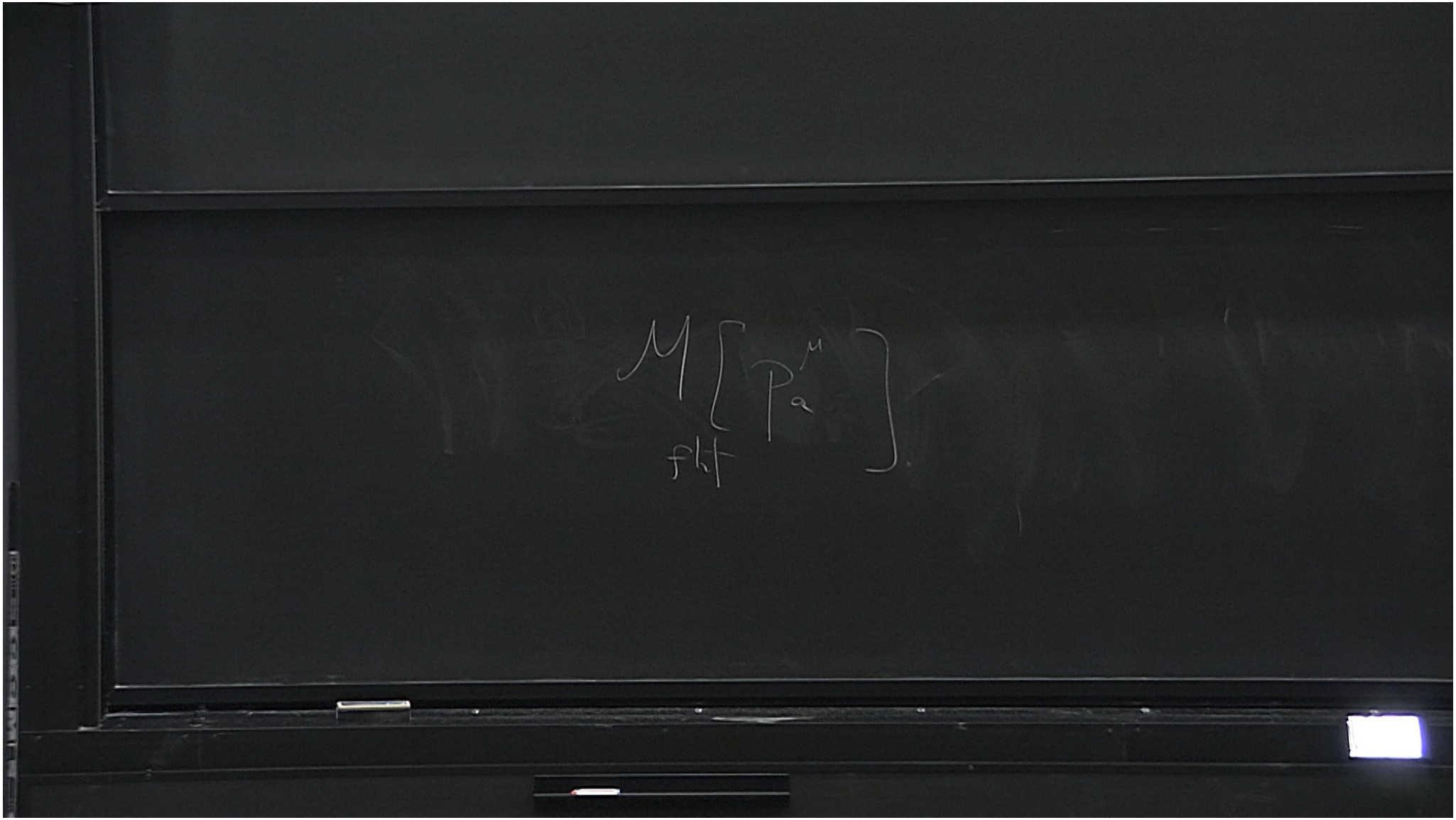
$p_a^2 = m_a^2$

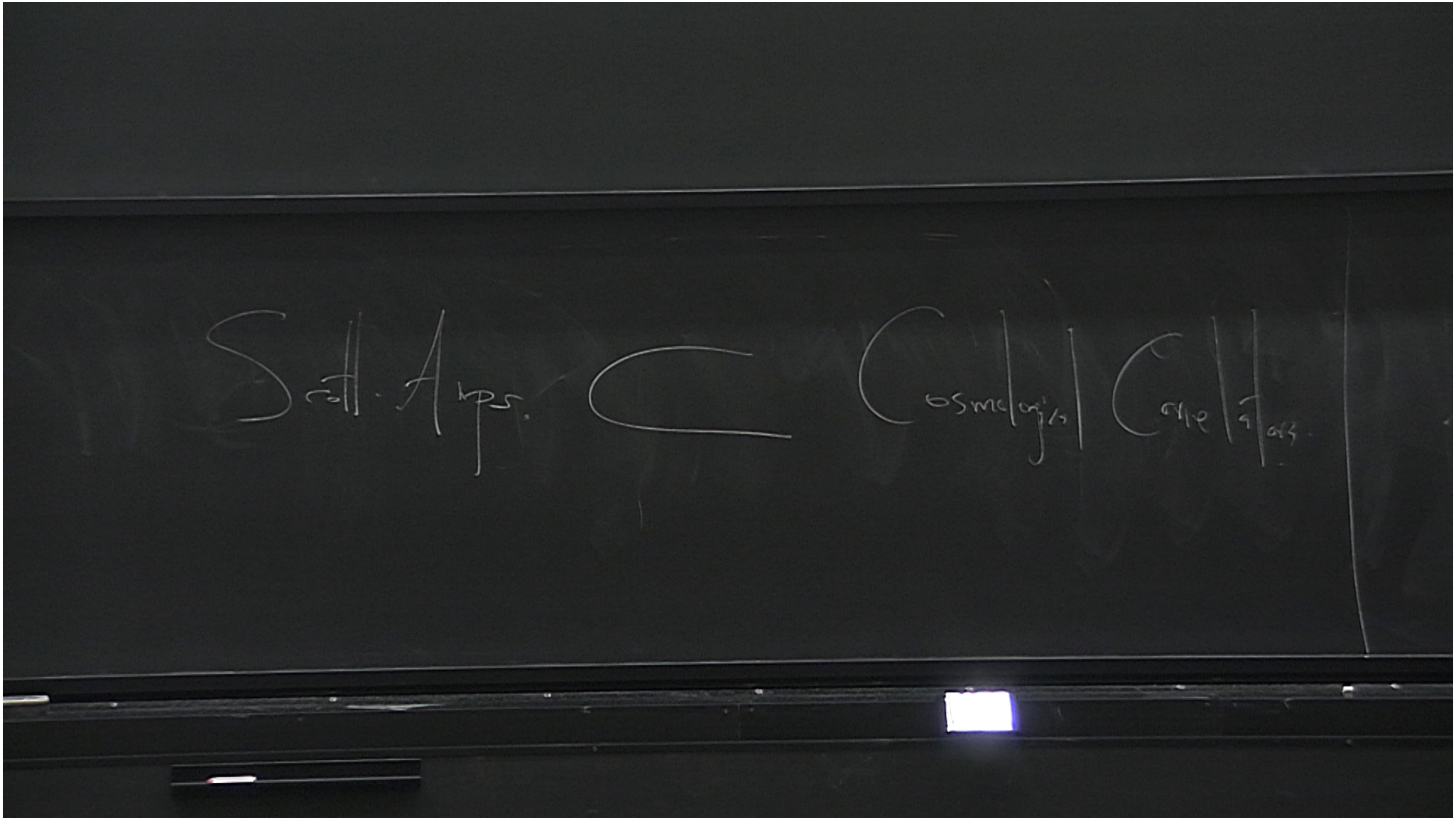
s_a

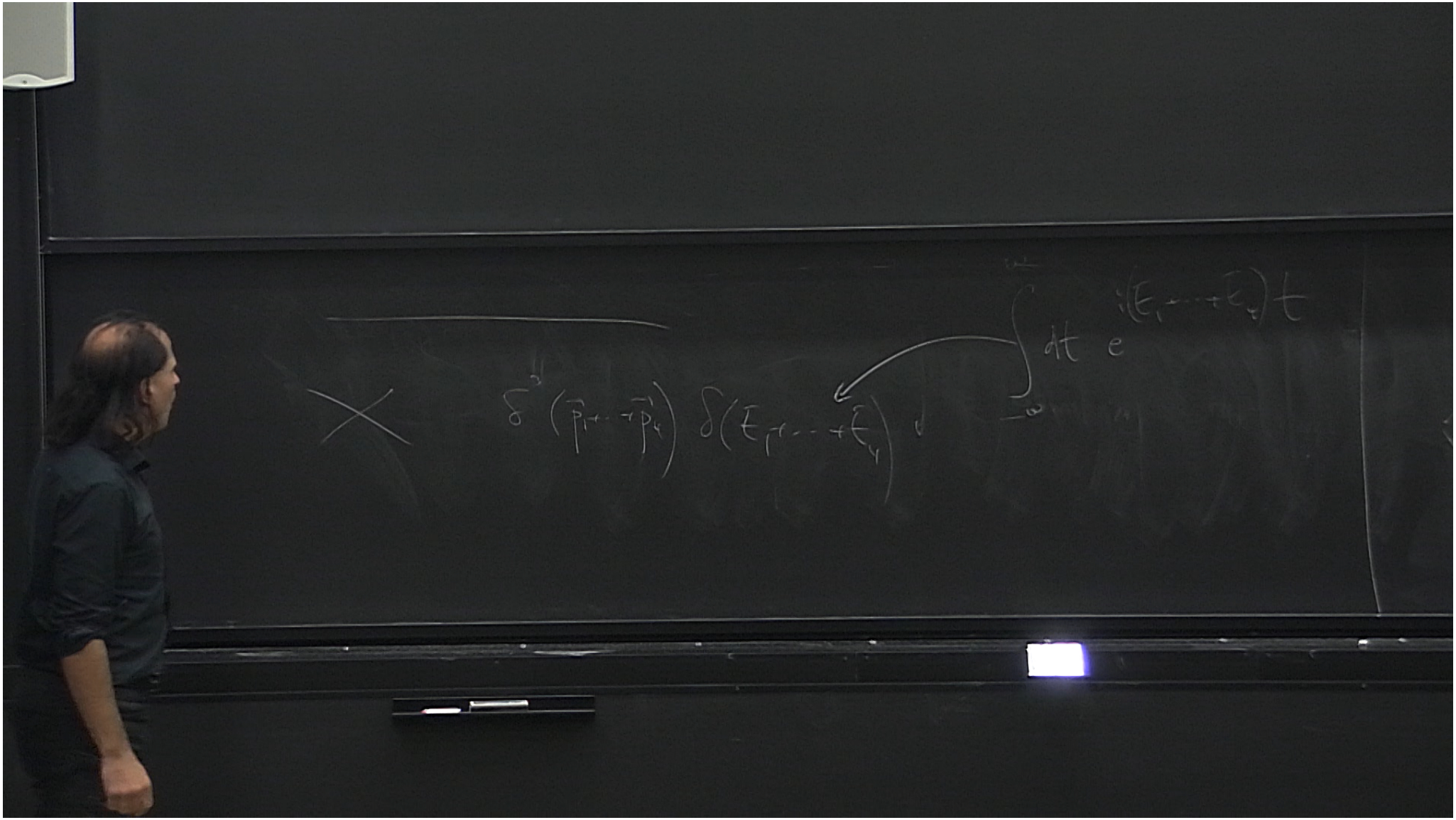
$\vec{P}_T$, $\sum \vec{p}_a = 0$

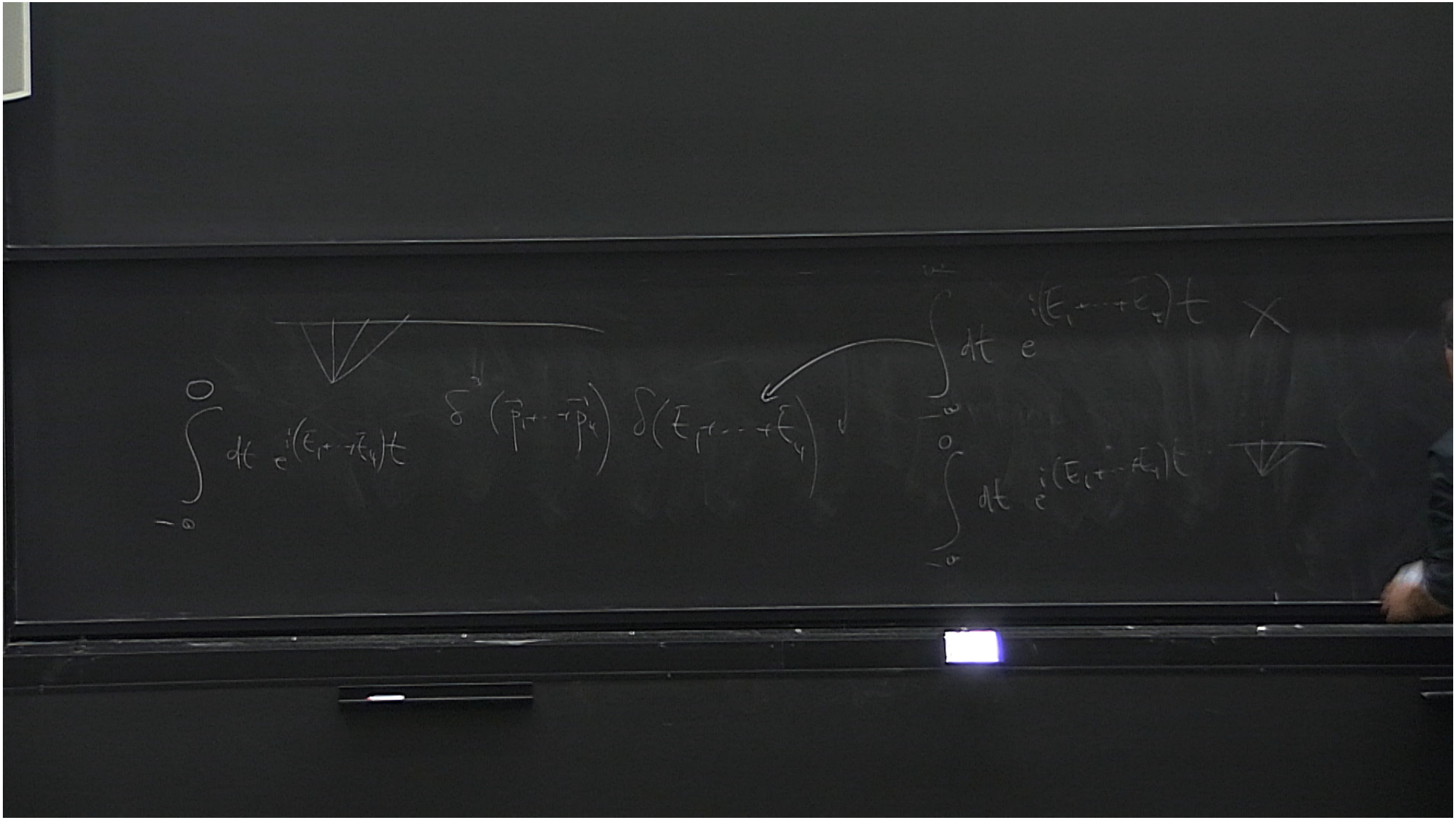
$\sum E_a = 0$

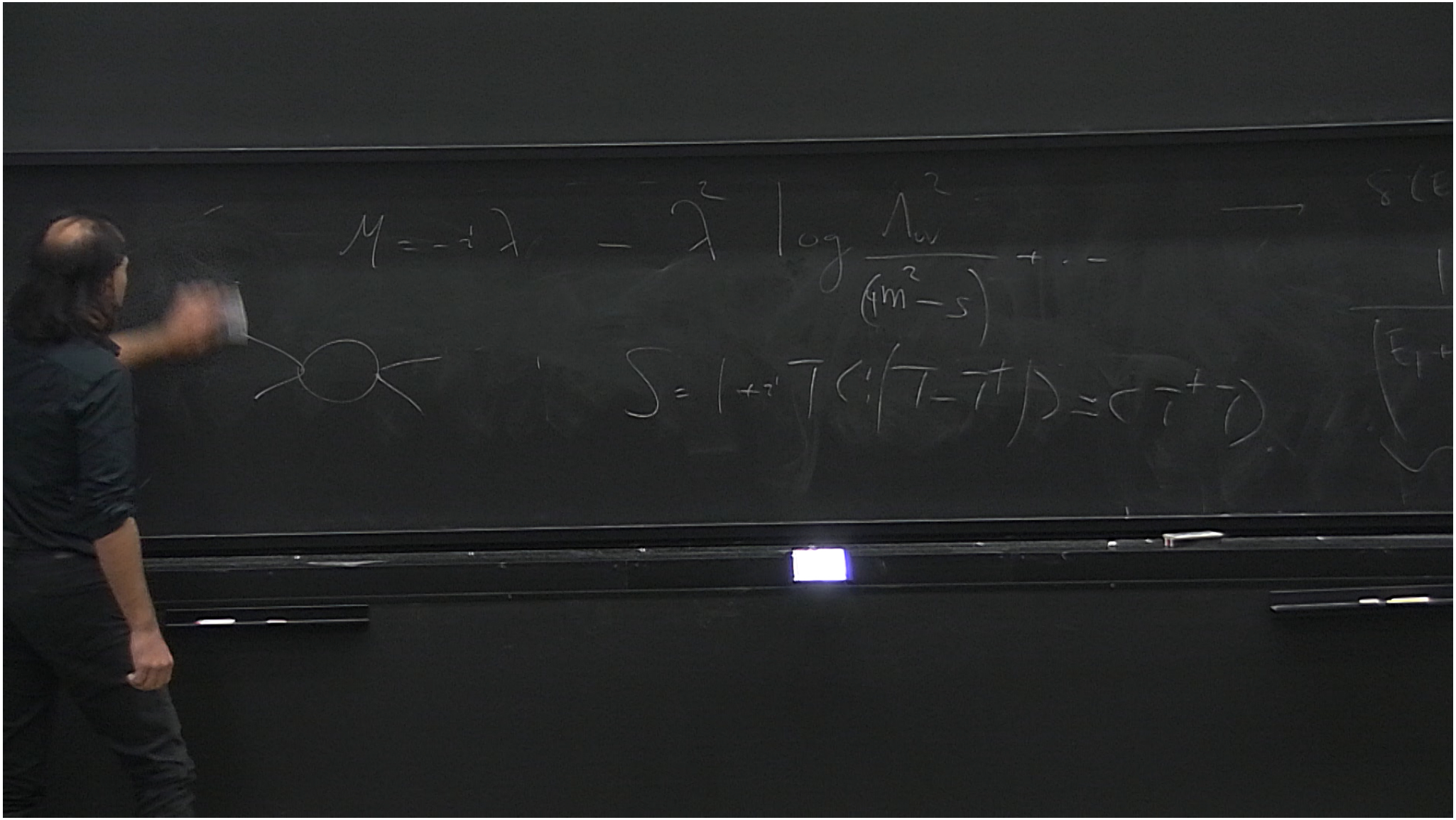

$F(\vec{p}_1, \cdots, \vec{p}_n)\ \delta(\sum \vec{p}_i)$


M [P_a^M]
flt




$\delta^{(3)}(\vec{p}_1 + \cdots + \vec{p}_4)\, \delta(E_1 + \cdots + E_4)$
$\int_{-\infty}^{\infty} dt\, e^{i(E_1 + \cdots + E_4)t}$


$\int_{-\infty}^{0} dt\, e^{i(E_1+\cdots+E_4)t}\, \delta^3(\vec{p}_1+\cdots+\vec{p}_4)\, \delta(E_1+\cdots+E_4)$
$\int_{-\infty}^{\infty} dt\, e^{i(E_1+\cdots+E_4)t} \times$
$\int_{-\infty}^{0} dt\, e^{i(E_1+\cdots+E_4)t}$


$\mathcal{M} = -i\lambda - \lambda^2 \log \frac{\Lambda_{UV}^2}{(4m^2 - s)} + \cdots$
$S = 1 + i T$
$\delta(E_1 + E_2 - E_1' - E_2')$