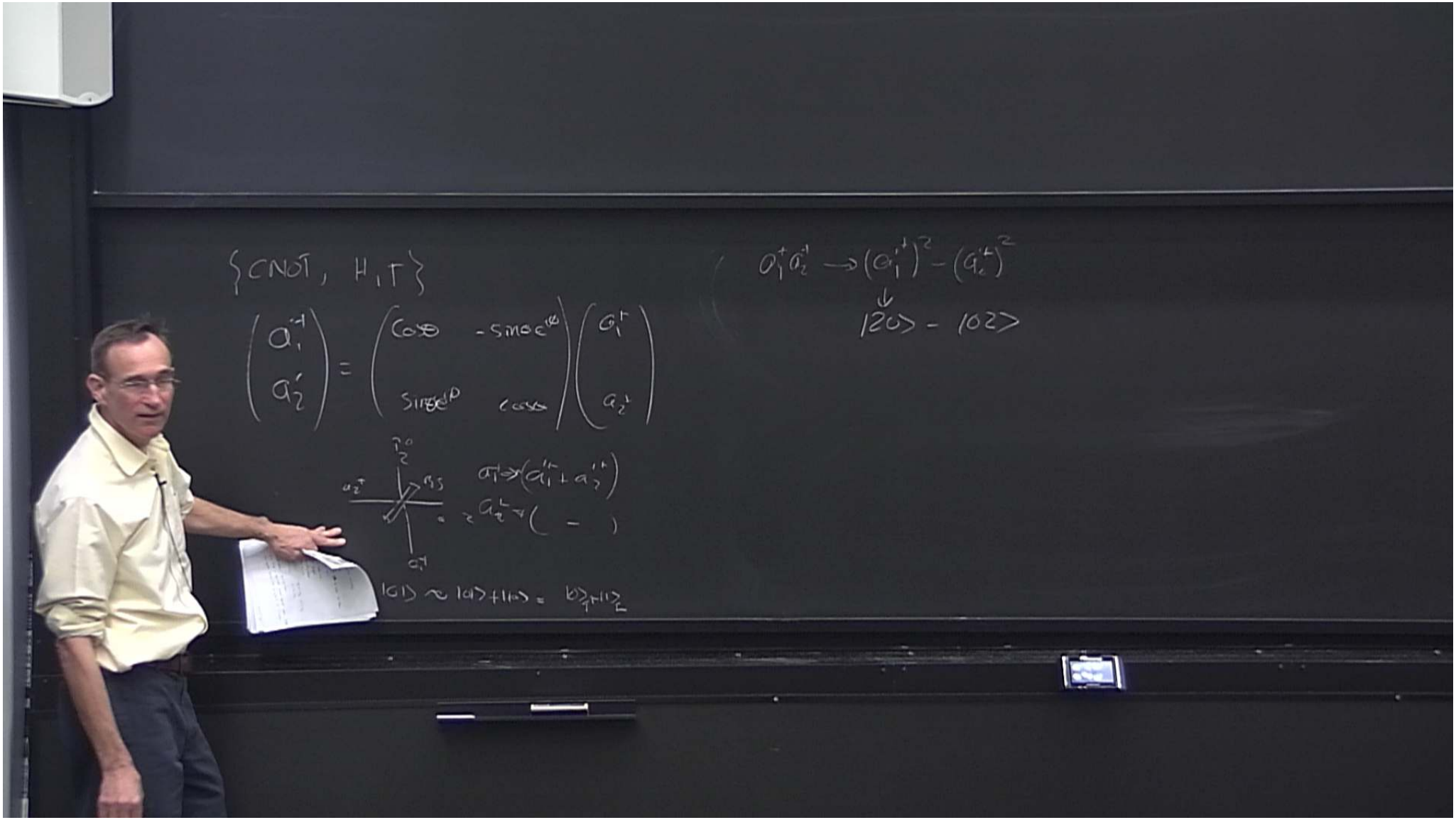
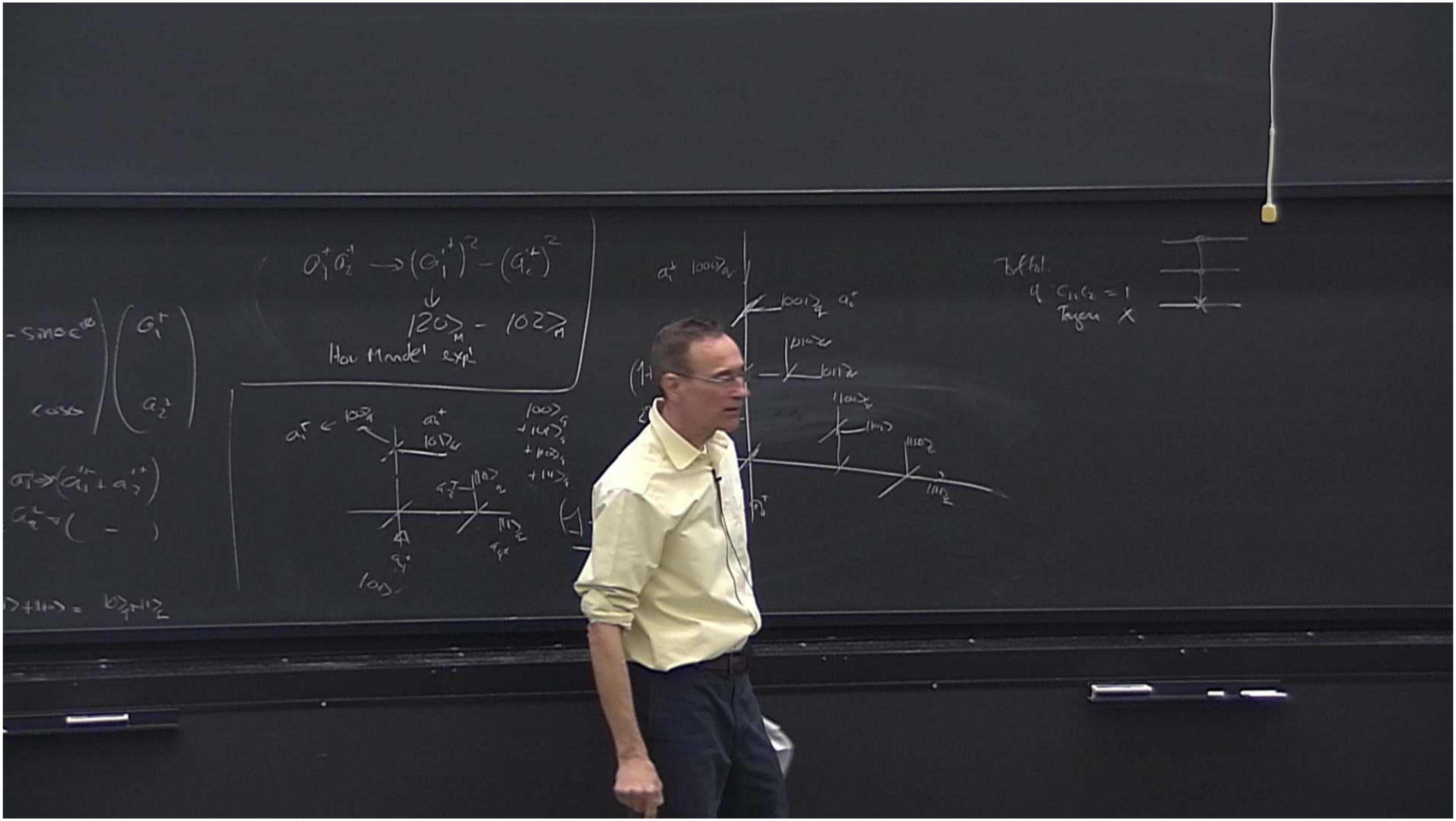
Title: PSI 2015/2016 Quantum Information - Lecture 4

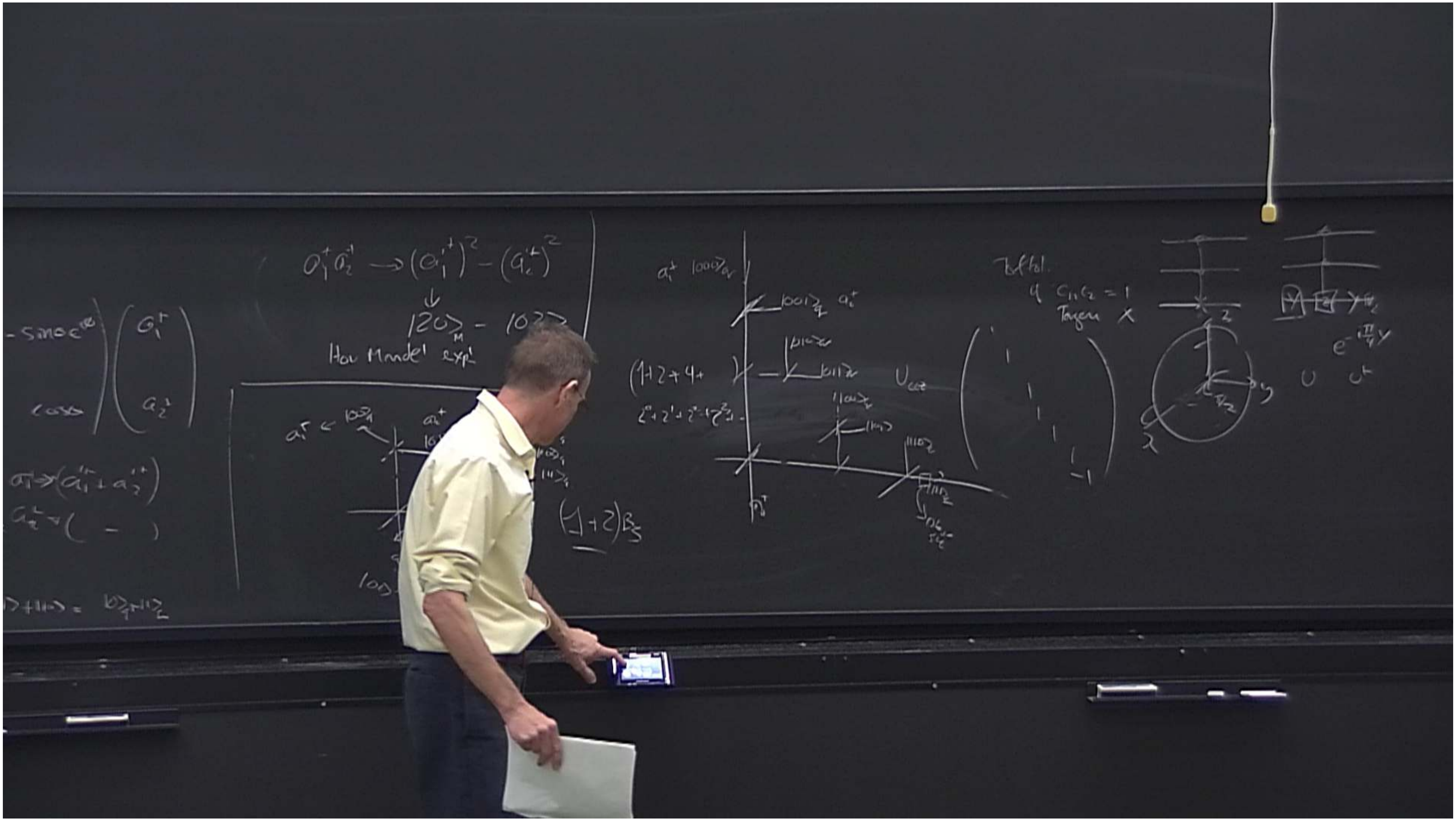
Date: Feb 25, 2016 11:30 AM

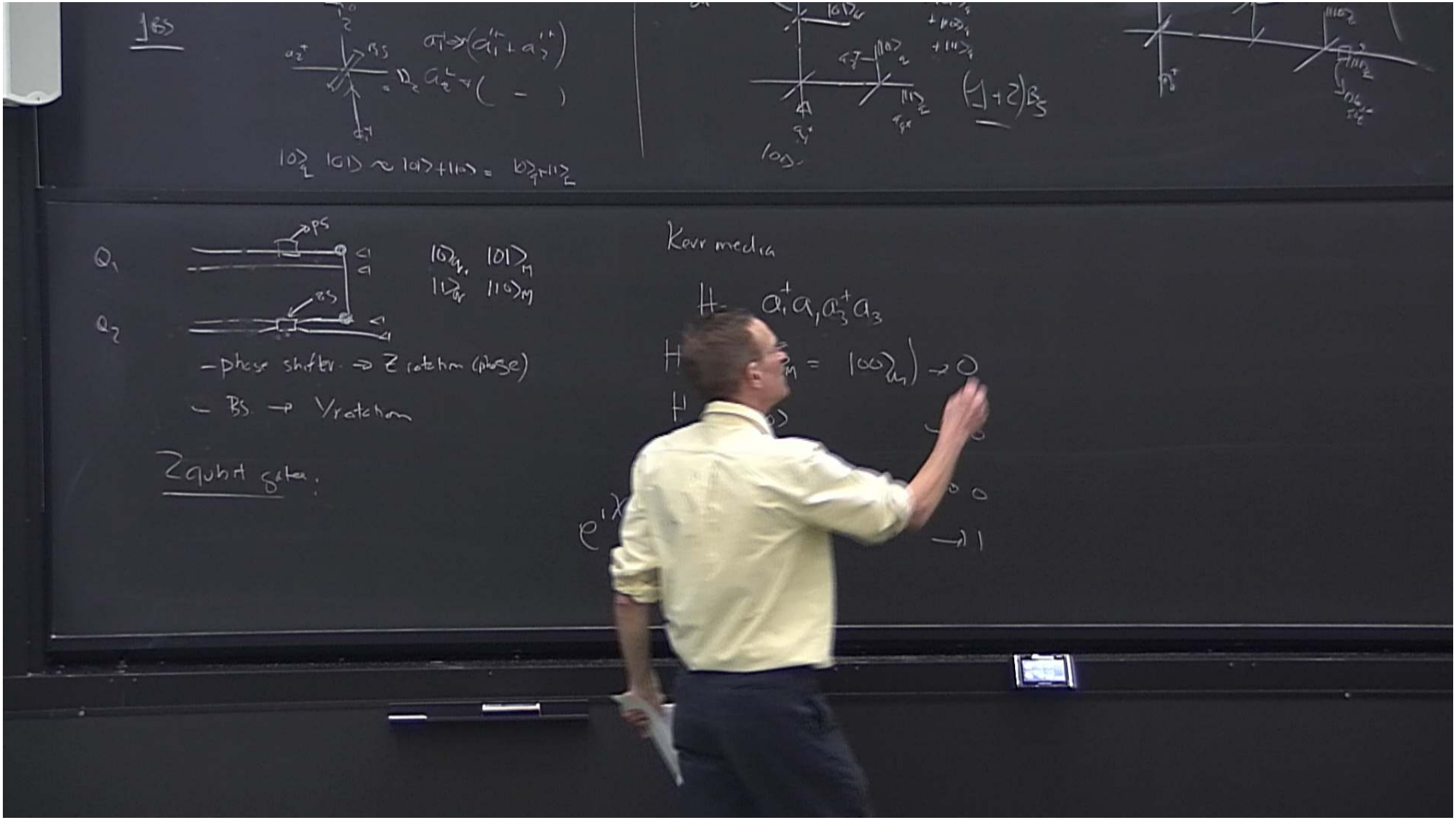
URL: http://pirsa.org/16020081

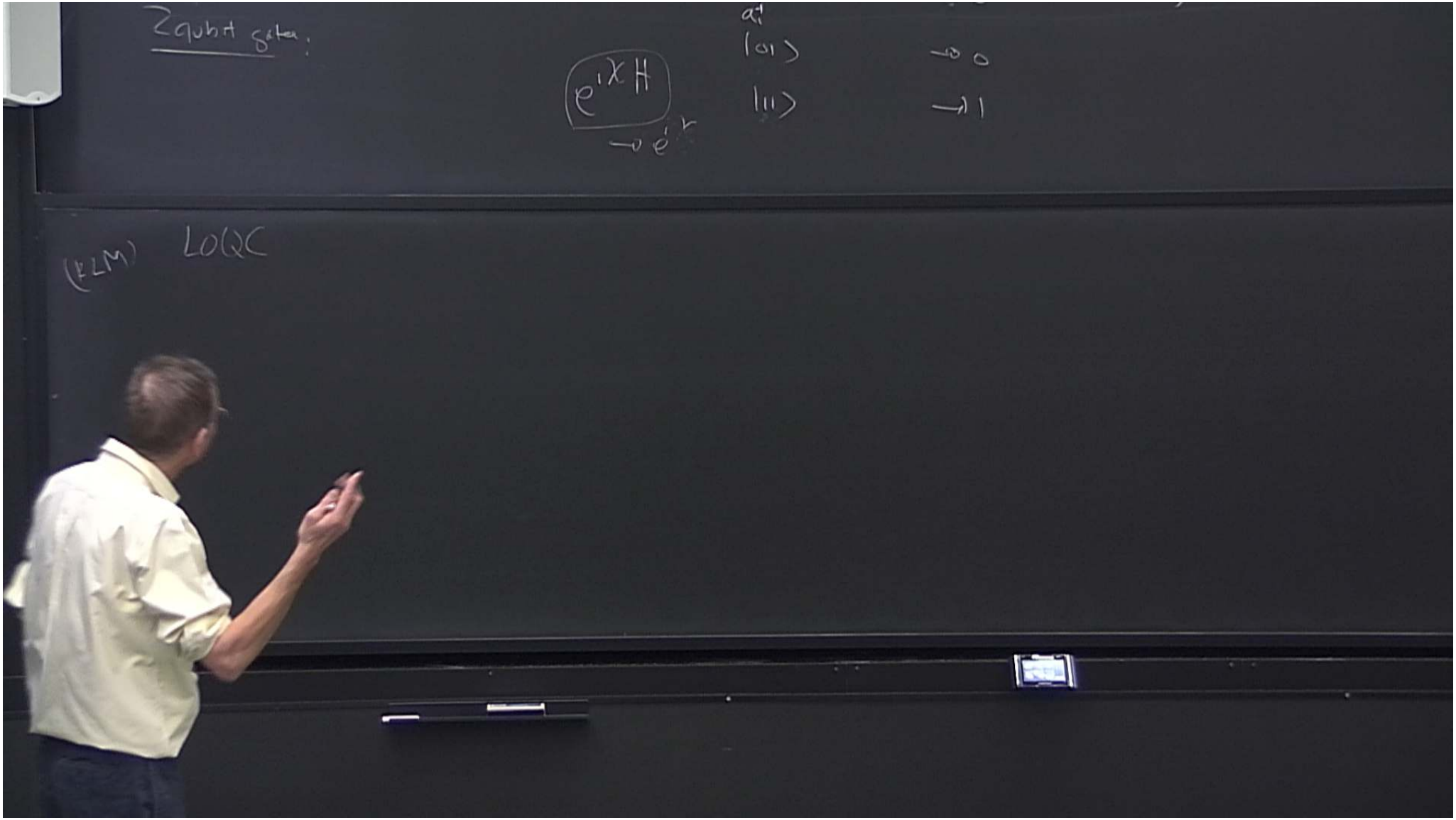
Abstract:

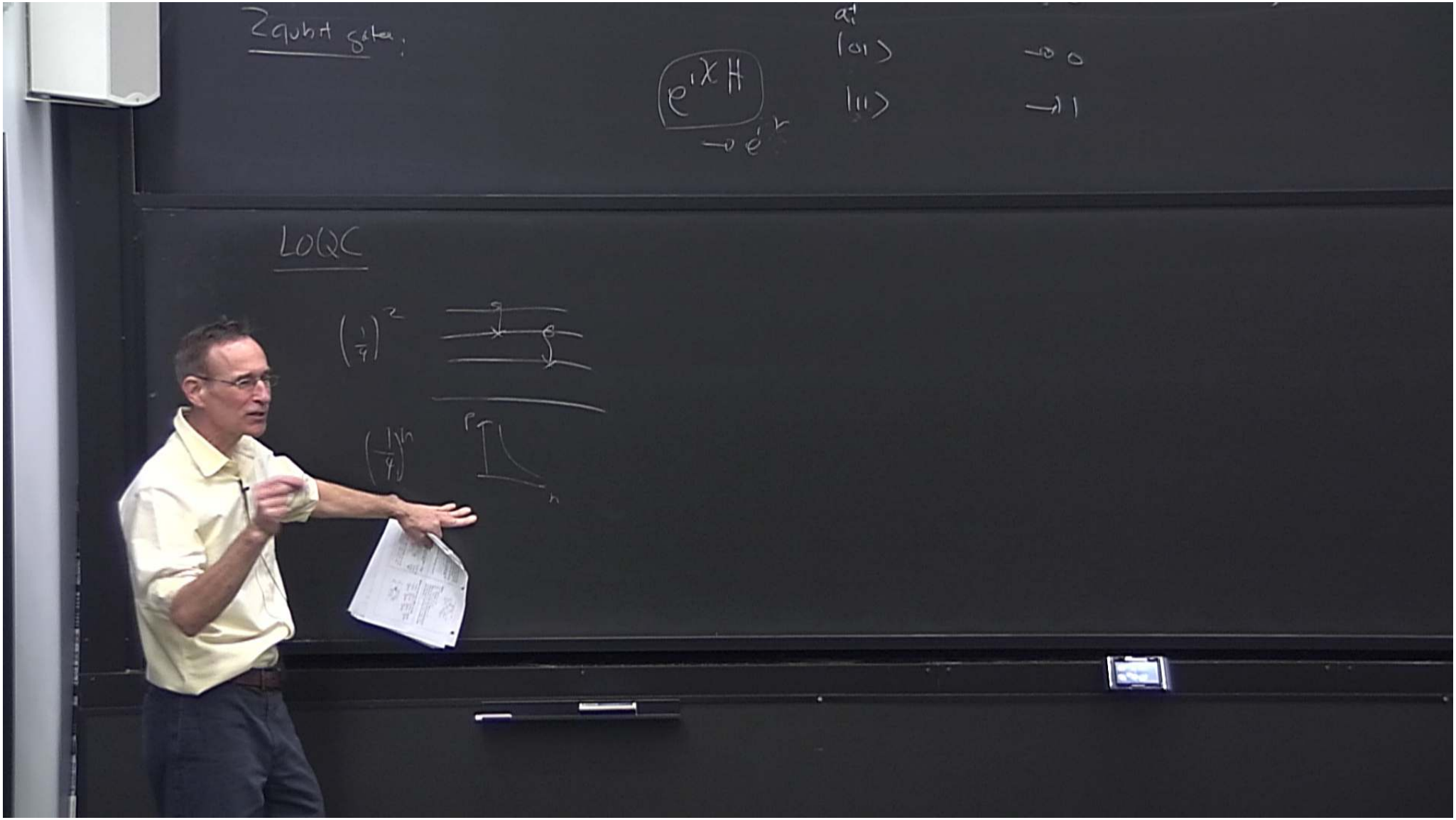

{CNOT, H, T}
$a_1^\dagger a_2^\dagger \rightarrow (a_1'^\dagger)^2 - (a_2'^\dagger)^2$
$|20\rangle - |02\rangle$
$\begin{pmatrix} a_1'^\dagger \\ a_2'^\dagger \end{pmatrix} = \begin{pmatrix} \cos\theta & -\sin\theta e^{i\alpha} \\ \sin\theta e^{i\beta} & \cos\theta \end{pmatrix} \begin{pmatrix} a_1^\dagger \\ a_2^\dagger \end{pmatrix}$
$a_1^\dagger \rightarrow (a_1'^\dagger + a_2'^\dagger)$
$|01\rangle \approx |01\rangle + |10\rangle = |0\rangle_1 |1\rangle_2$

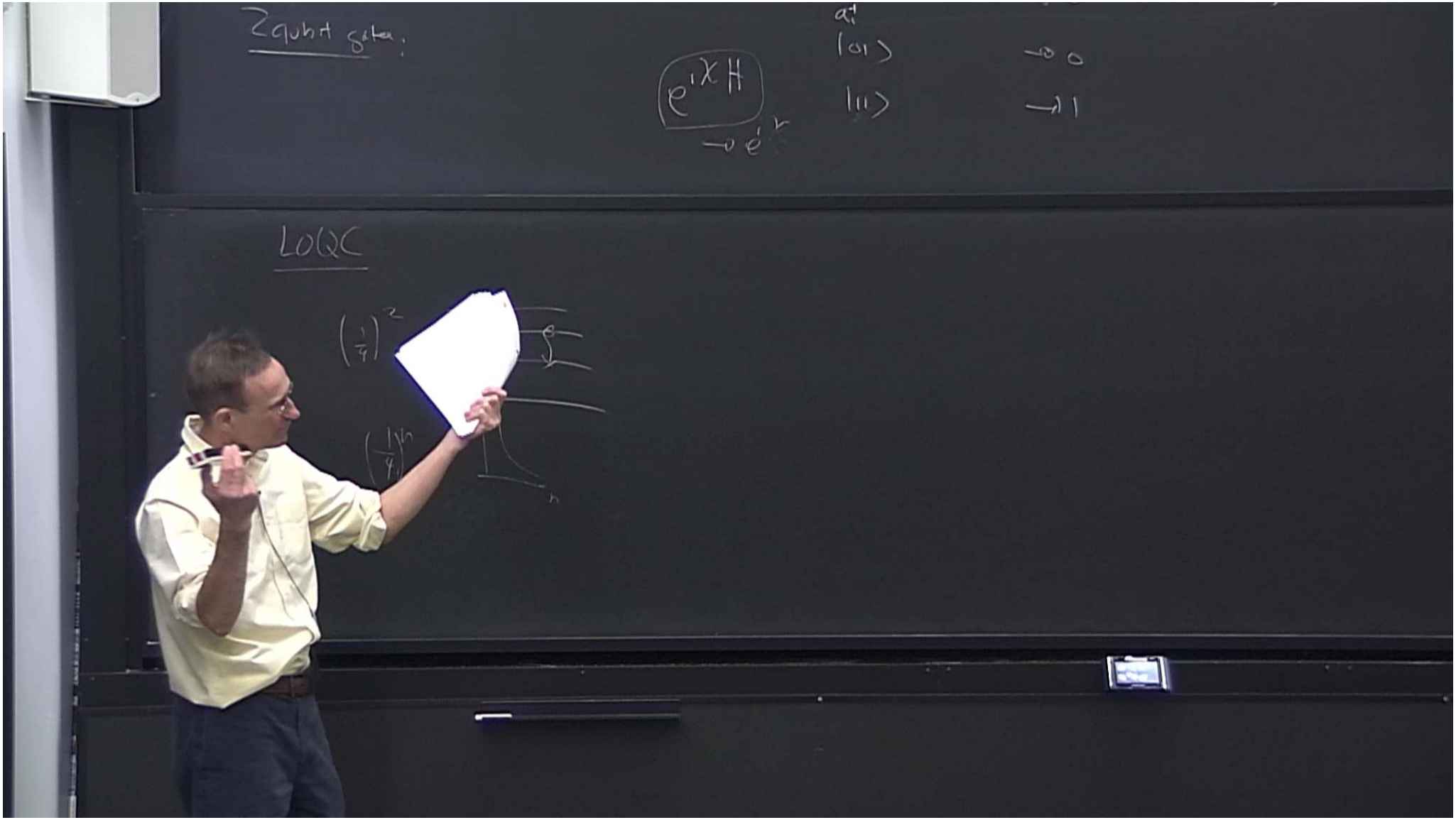


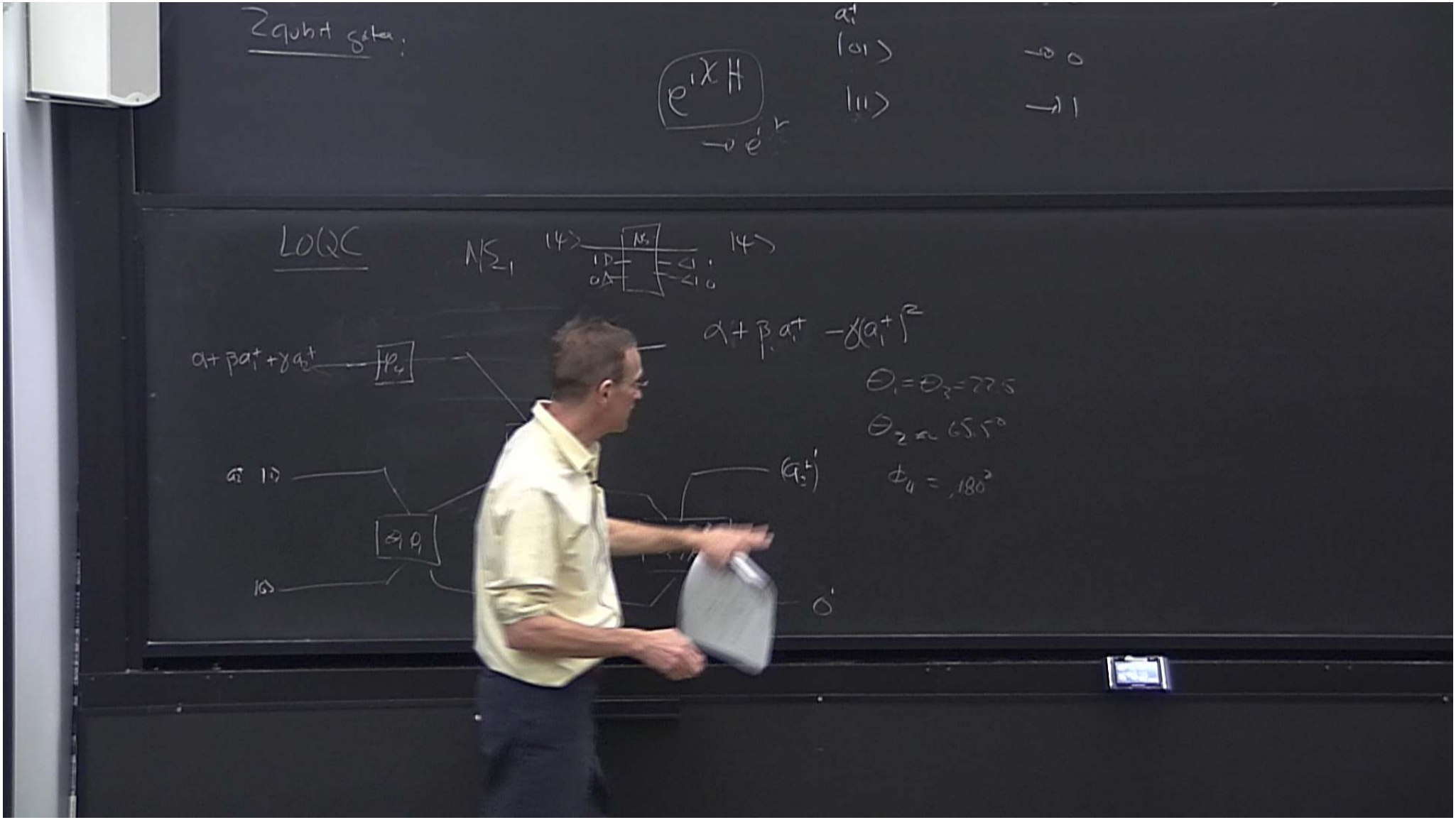


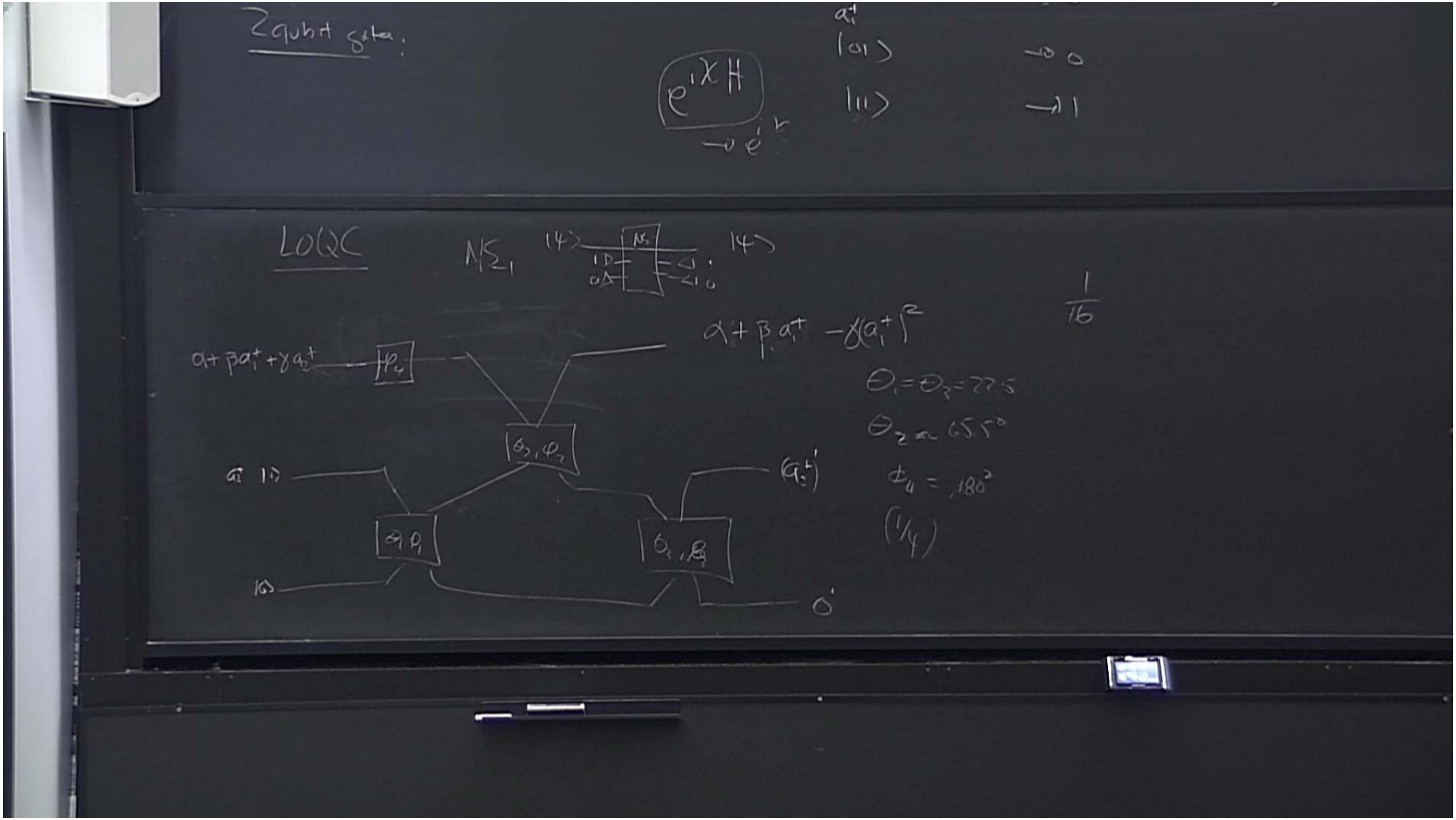

BS
PS
Kerr media
2 qubit gates:


2 qubit gates:
e^{iXH}
$|01\rangle \to 0$
$|11\rangle \to 1$
(KLM) LOQC


2 qubit gates:
$a_1^\dagger$
$|01\rangle \to 0$
$|11\rangle \to 1$
$e^{i\chi H}$
$\to e^{i\chi}$
LOQC
$\left(\frac{1}{4}\right)^2$
$\left(\frac{1}{4}\right)^n$
n


2 qubit gates:
$e^{i\chi H}$
$a_i^\dagger|01\rangle \to 0$
$|11\rangle \to 1$
LOQC


2 qubit gates:
LOQC
$e^{i\chi H}$
$|01\rangle \to 0$
$|11\rangle \to 1$
$\alpha + \beta a_1^\dagger + \gamma a_2^\dagger$
$\alpha + \beta a_1^\dagger - \gamma (a_1^\dagger)^2$
$\theta_1 = \theta_2 = 77.5$
$\theta_2 = 65.5°$
$\phi_4 = 180°$


2 qubit gates:
$a_1^\dagger$
$|01\rangle \to 0$
$|11\rangle \to 1$
$e^{i\chi H}$
$\to e^{i\chi}$
LOQC
NS_1
$|4\rangle$
$|4\rangle$
$\frac{1}{16}$
$\alpha + \beta a_1^\dagger + \gamma a_2^\dagger$
$\alpha + \beta a_1^\dagger - \gamma (a_1^\dagger)^2$
$\theta_1 = \theta_2 = 77.5$
$\theta_2 \approx 65.5°$
$\phi_4 = 180°$
$(1/4)$
$|1\rangle$
$|0\rangle$
$|0\rangle$