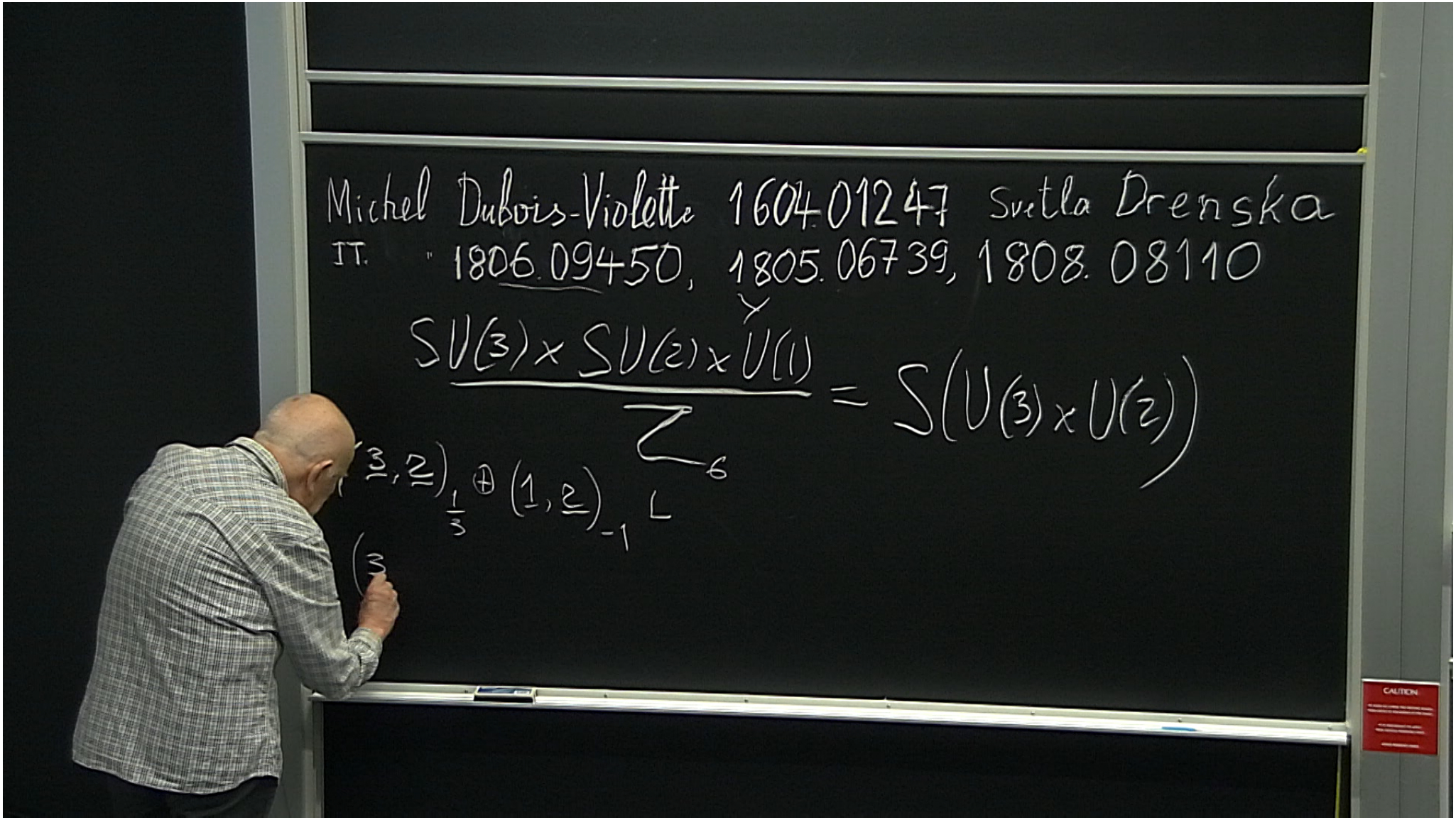
Title: Talk 5

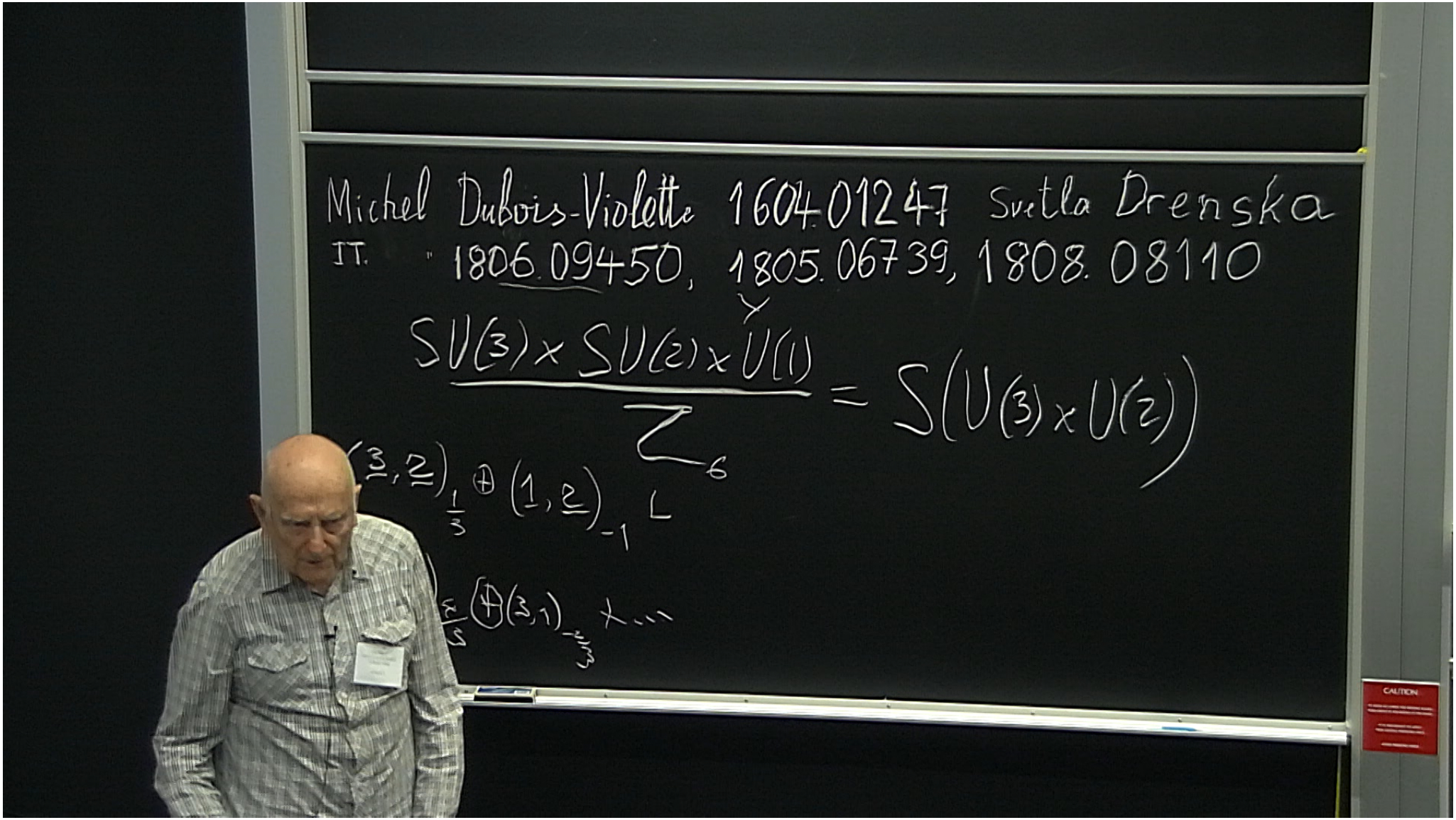
Speakers:

Collection: Simplicity III

Date: September 10, 2019 - 9:00 AM

URL: http://pirsa.org/19090072


Michel Dubois-Violette 1604.01247 Svetla Drenska
IT. " 1806.09450, 1805.06739, 1808.08110
$\frac{SU(3)\times SU(2)\times U(1)}{Z_6} = S(U(3)\times U(2))$
$(3,2)_{\frac{1}{3}} \oplus (1,2)_{-1}$ L
(3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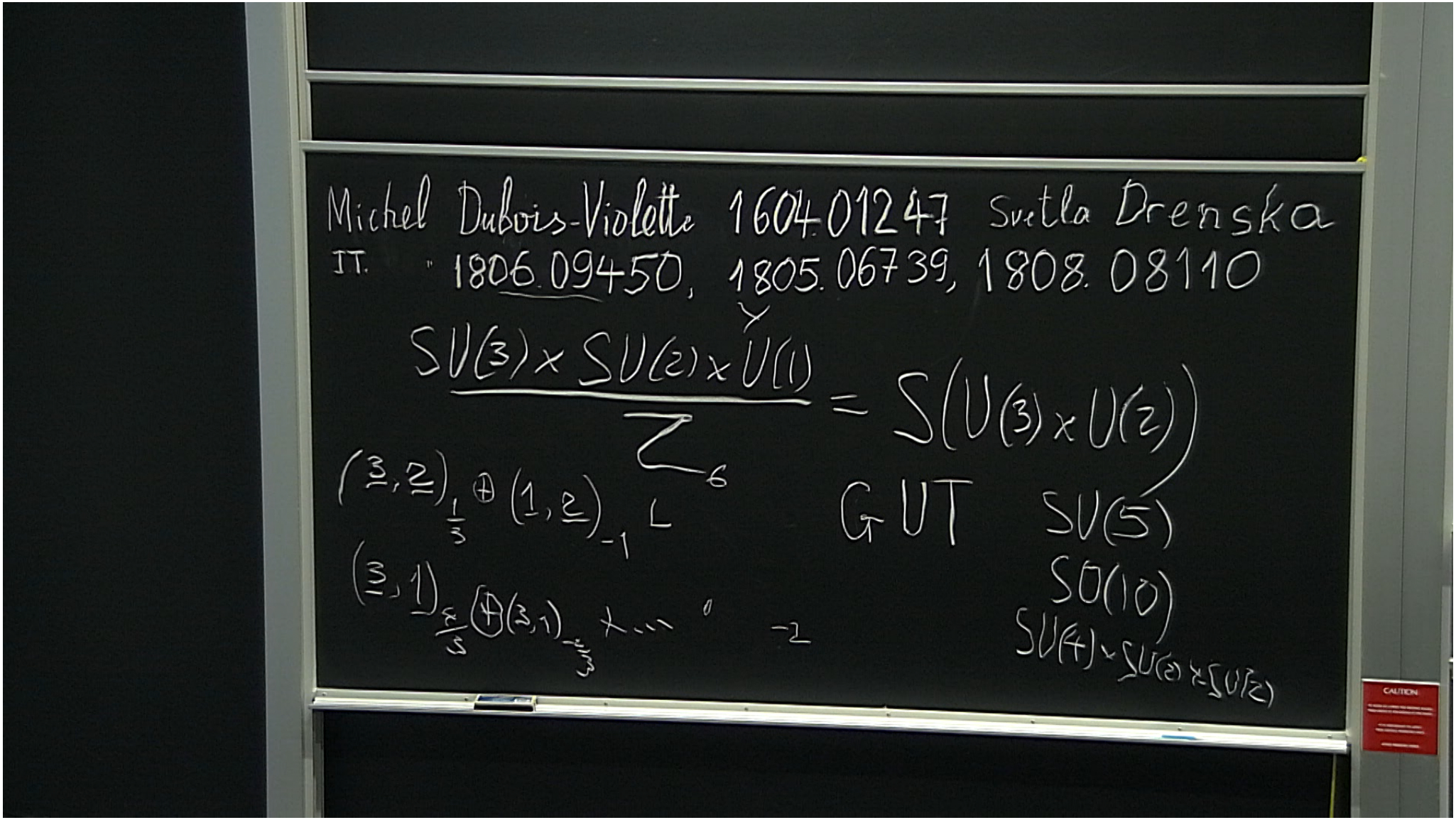
$\frac{SU(3)\times SU(2)\times U(1)}{Z_6} = S(U(3)\times U(2))$
$(3,2)_{\frac{1}{3}} \oplus (1,2)_{-1}$ L
$\oplus (3,1)_{\frac{4}{3}}$
CAUTION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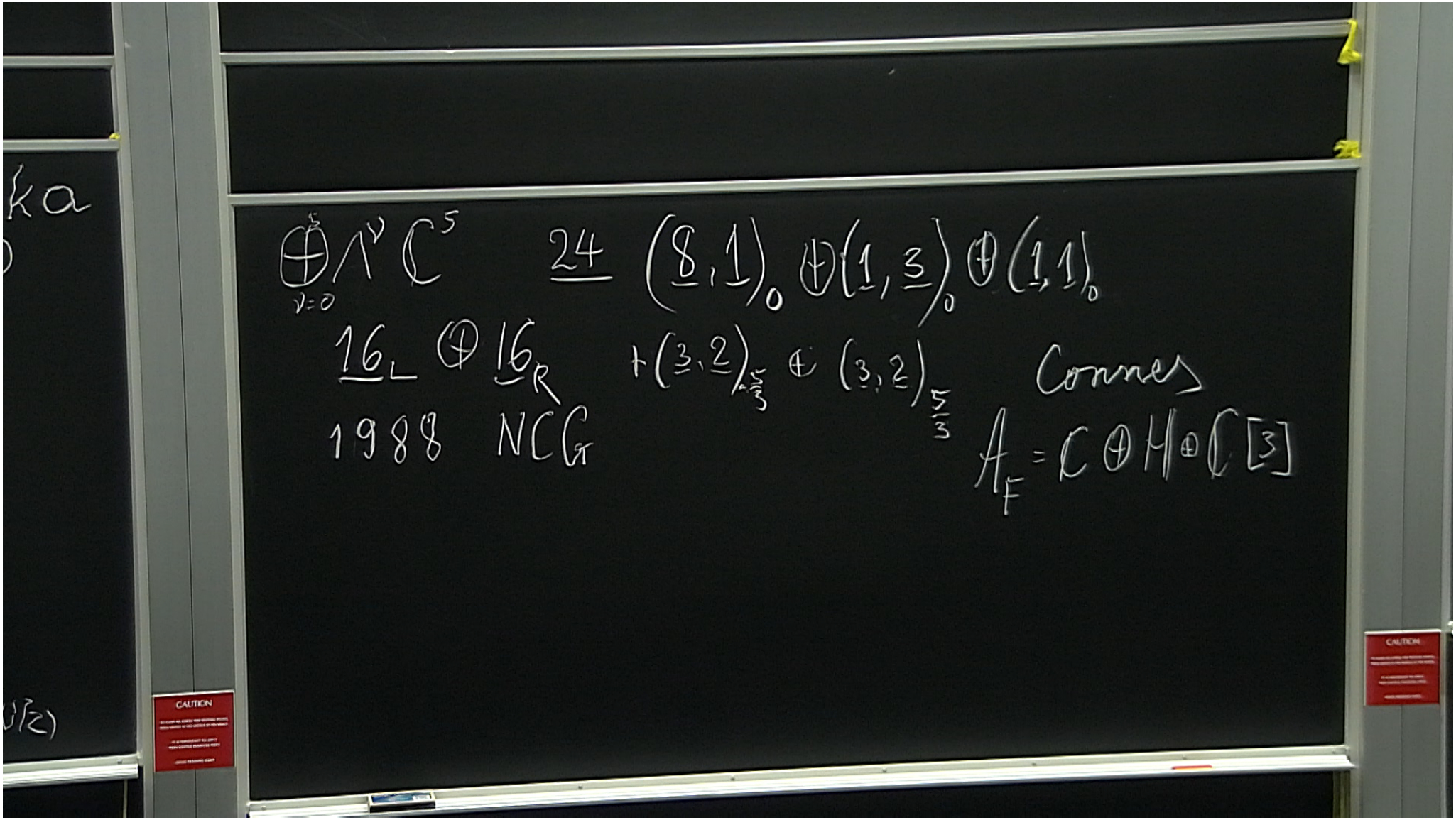
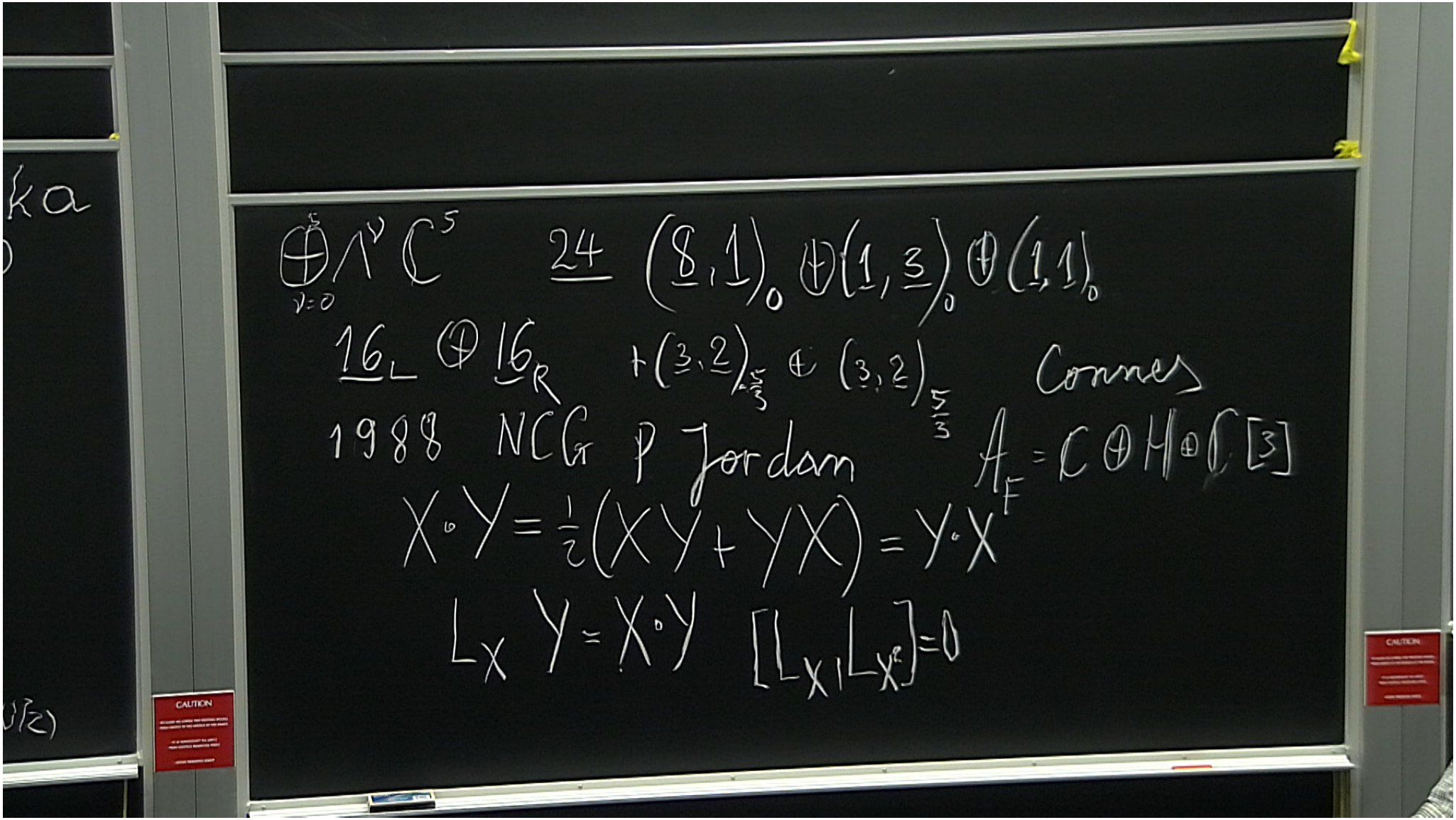
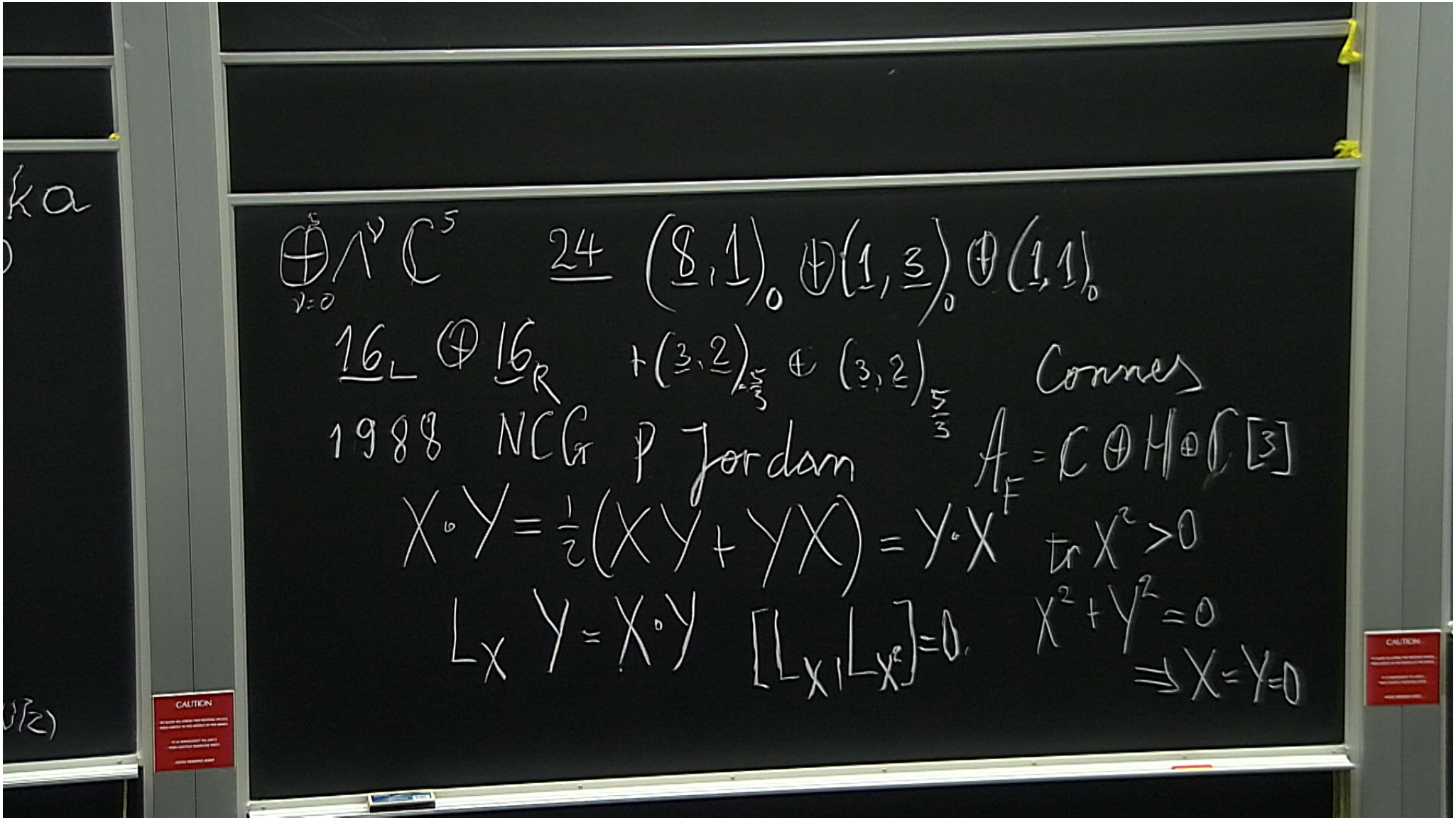
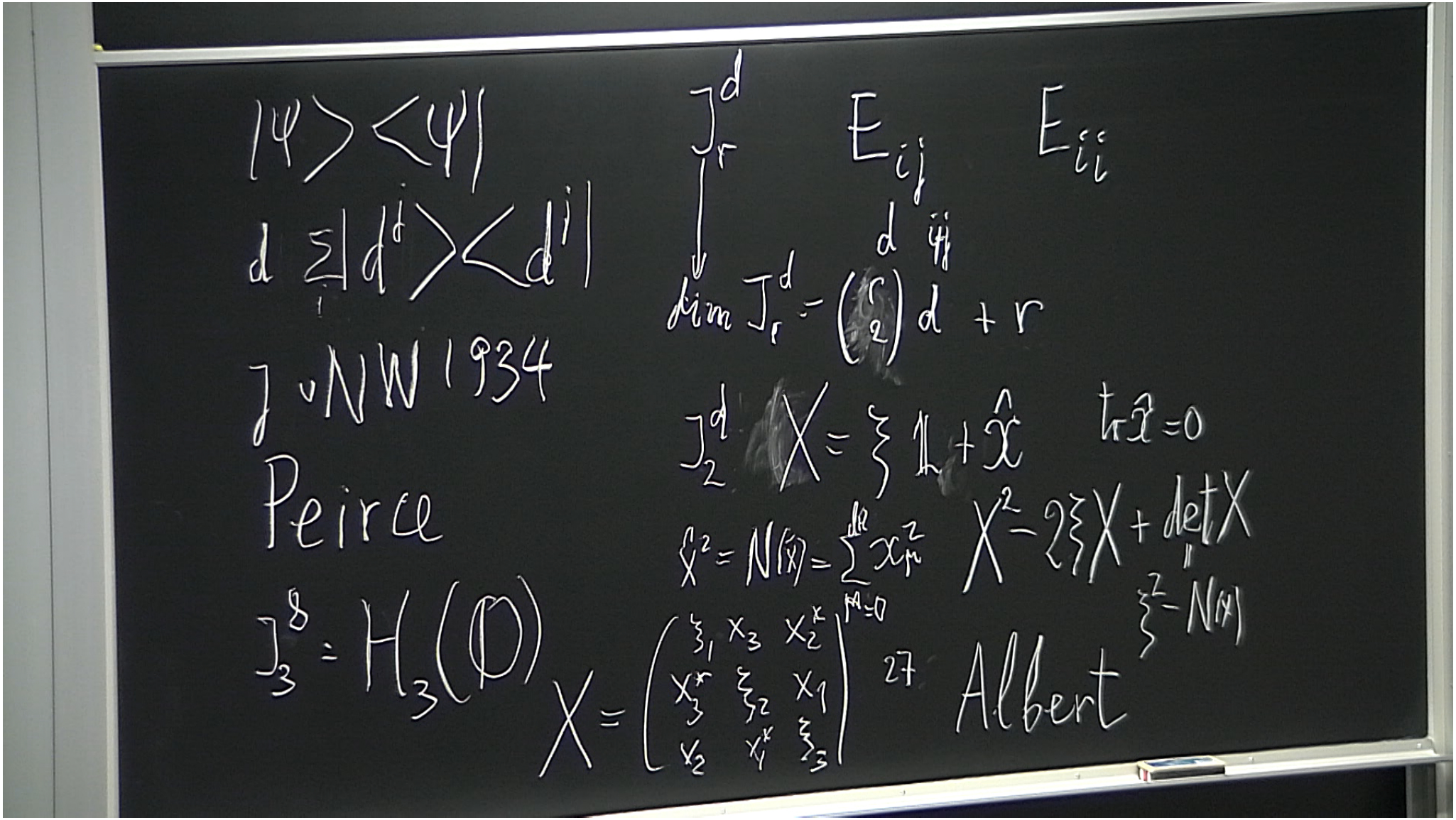
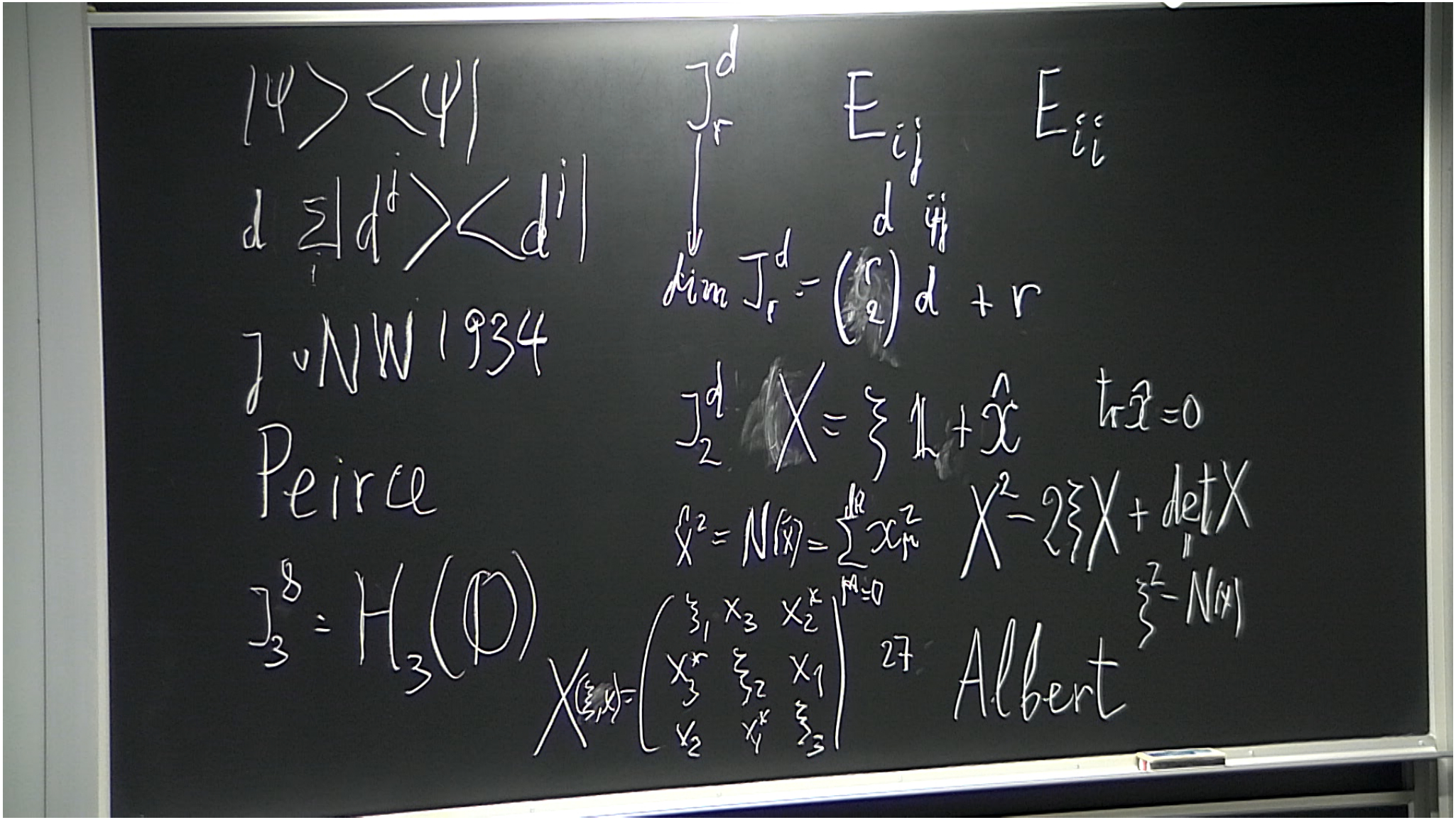
SU(3) × SU(2) × U(1) / Z6 = S(U(3) × U(2))
(3,2)1/3 ⊕ (1,2)-1 L
(3,1)4/3 ⊕ (3,1)-2/3 ⊕ ... 0 -2
GUT
SU(5)
SO(10)
SU(4) × SU(2) × SU(2)


$\bigoplus_{\nu=0}^{5} \Lambda^\nu \mathbb{C}^5$
24
$(8,1)_0 \oplus (1,3)_0 \oplus (1,1)_0$
$16_L \oplus 16_R$
$+ (3,2)_{\frac{5}{3}} \oplus (3,2)_{\frac{5}{3}}$
Connes
1988 NCG
$A_F = \mathbb{C} \oplus \mathbb{H} \oplus M_3(\mathbb{C})$


$\bigoplus_{\nu=0}^{5} \Lambda^\nu \mathbb{C}^5$ 24 $(8,1)_0 \oplus (1,3)_0 \oplus (1,1)_0$
$16_L \oplus 16_R + (3,2)_{-\frac{5}{3}} \oplus (3,2)_{\frac{5}{3}}$
Connes
1988 NCG P Jordan
$A_F = \mathbb{C} \oplus \mathbb{H} \oplus M_3(\mathbb{C})$
$X \circ Y = \frac{1}{2}(XY + YX) = Y \circ X$
$L_X Y = X \circ Y$ $[L_X, L_{X^2}] = 0$
CAUTION
CAUTION


$\bigoplus_{\nu=0}^{5} \Lambda^\nu \mathbb{C}^5$ 24 $(8,1)_0 \oplus (1,3)_0 \oplus (1,1)_0$
$16_L \oplus 16_R + (3,2)_{-\frac{5}{3}} \oplus (3,2)_{\frac{5}{3}}$
Connes
1988 NCG P Jordan
$A_F = \mathbb{C} \oplus \mathbb{H} \oplus M_3(\mathbb{C})$
$X \circ Y = \frac{1}{2}(XY + YX) = Y \circ X$
$\mathrm{tr}\, X^2 > 0$
$L_X Y = X \circ Y$
$[L_X, L_{X^2}] = 0$
$X^2 + Y^2 = 0$
$\Rightarrow X = Y = 0$


$|\psi\rangle\langle\psi|$
$d \sum_i |d^i\rangle\langle d^i|$
JvNW 1934
Peirce
$J_3^8 = H_3(\mathbb{O})$
J_r^d
E_{ij}
E_{ii}
$\dim J_r^d = \binom{d}{2} d + r$
J_2^d
$X = \xi \mathbb{1} + \hat{x}$
$\mathrm{tr}\hat{x} = 0$
$\xi^2 = N(x) = \sum_{\mu=0}^{d} x_\mu^2$
$X^2 - 2\xi X + \det X$
$\xi^2 - N(x)$
$X = \begin{pmatrix} \xi_1 & x_3 & x_2^* \\ x_3^* & \xi_2 & x_1 \\ x_2 & x_1^* & \xi_3 \end{pmatrix}$
27
Albert


$|\psi\rangle\langle\psi|$
$d \sum |d^i\rangle\langle d^i|$
J.v.N.W. 1934
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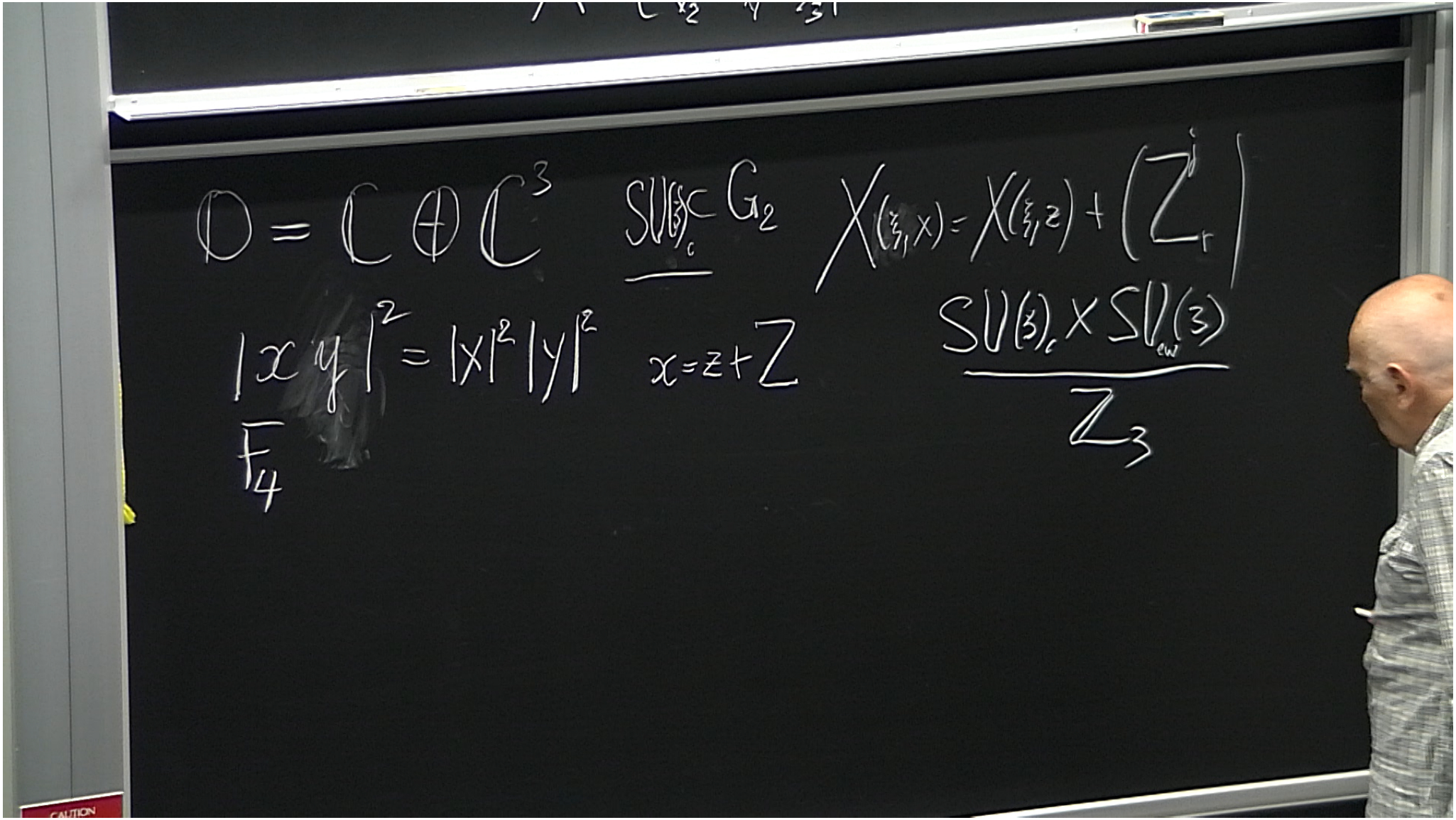
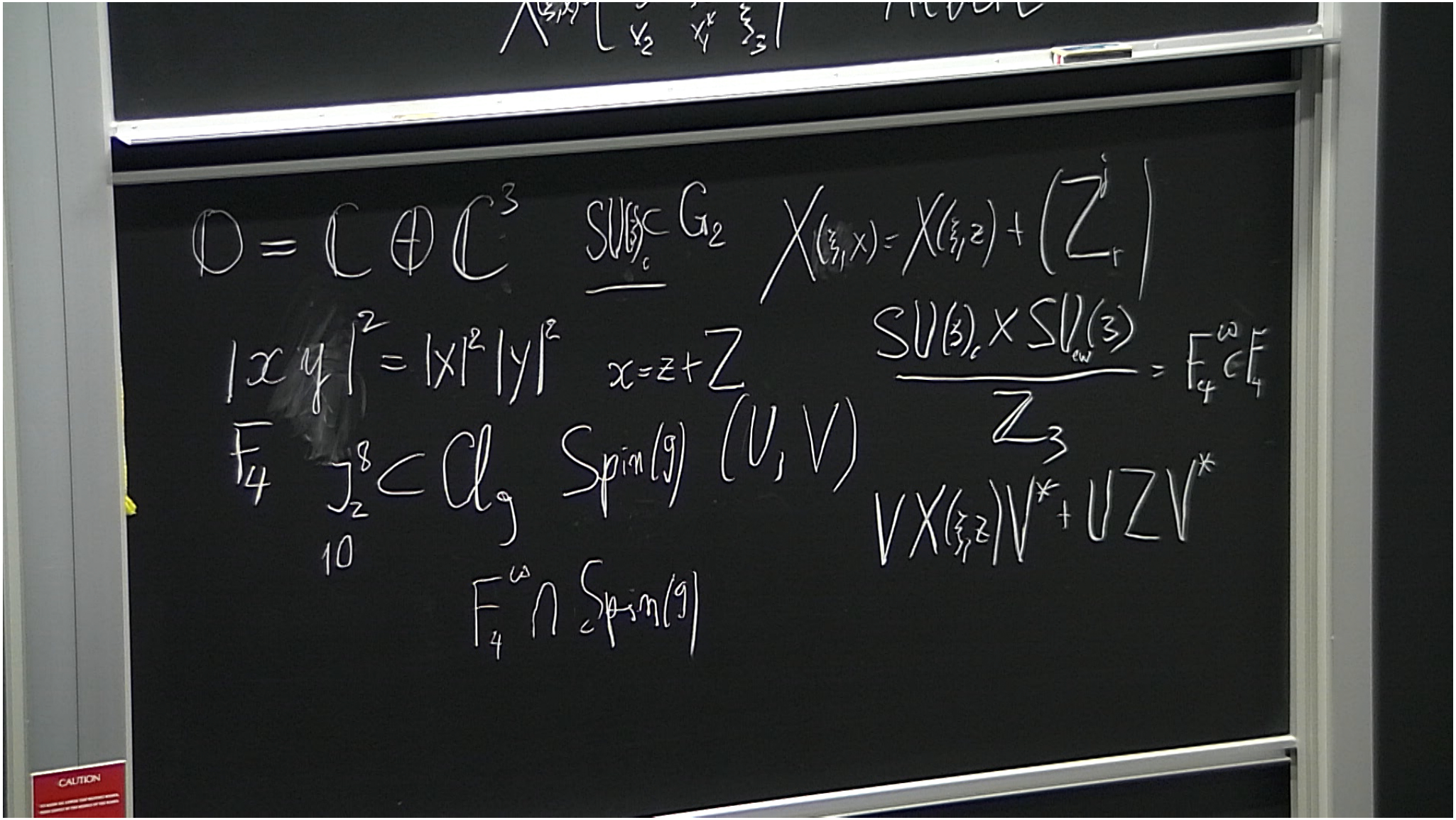
$J_3^8 = H_3(\mathbb{O})$
J_r^d
E_{ij}
E_{ii}
$\dim J_r^d = \binom{r}{2} d + r$
J_2^d
$X = \xi 1 + \hat{x}$
$\mathrm{tr}\hat{x} = 0$
$\xi^2 = N(x) = \sum_{i=0}^{d} x_i^2$
$X^2 - 2\xi X + \det X$
$\xi^2 = N(x)$
$X(\xi, x) = \begin{pmatrix} \xi_1 & x_3 & x_2^* \\ x_3^* & \xi_2 & x_1 \\ x_2 & x_1^* & \xi_3 \end{pmatrix}$
27
Albert


$\mathbb{O} = \mathbb{C} \oplus \mathbb{C}^3$
$SU(3)_c \subset G_2$
$X(\xi, x) = X(\xi, z) + (Z_r)$
$|xy|^2 = |x|^2 |y|^2$
$x = z + Z$
F_4
$\frac{SU(3)_c \times SU_{ew}(3)}{Z_3}$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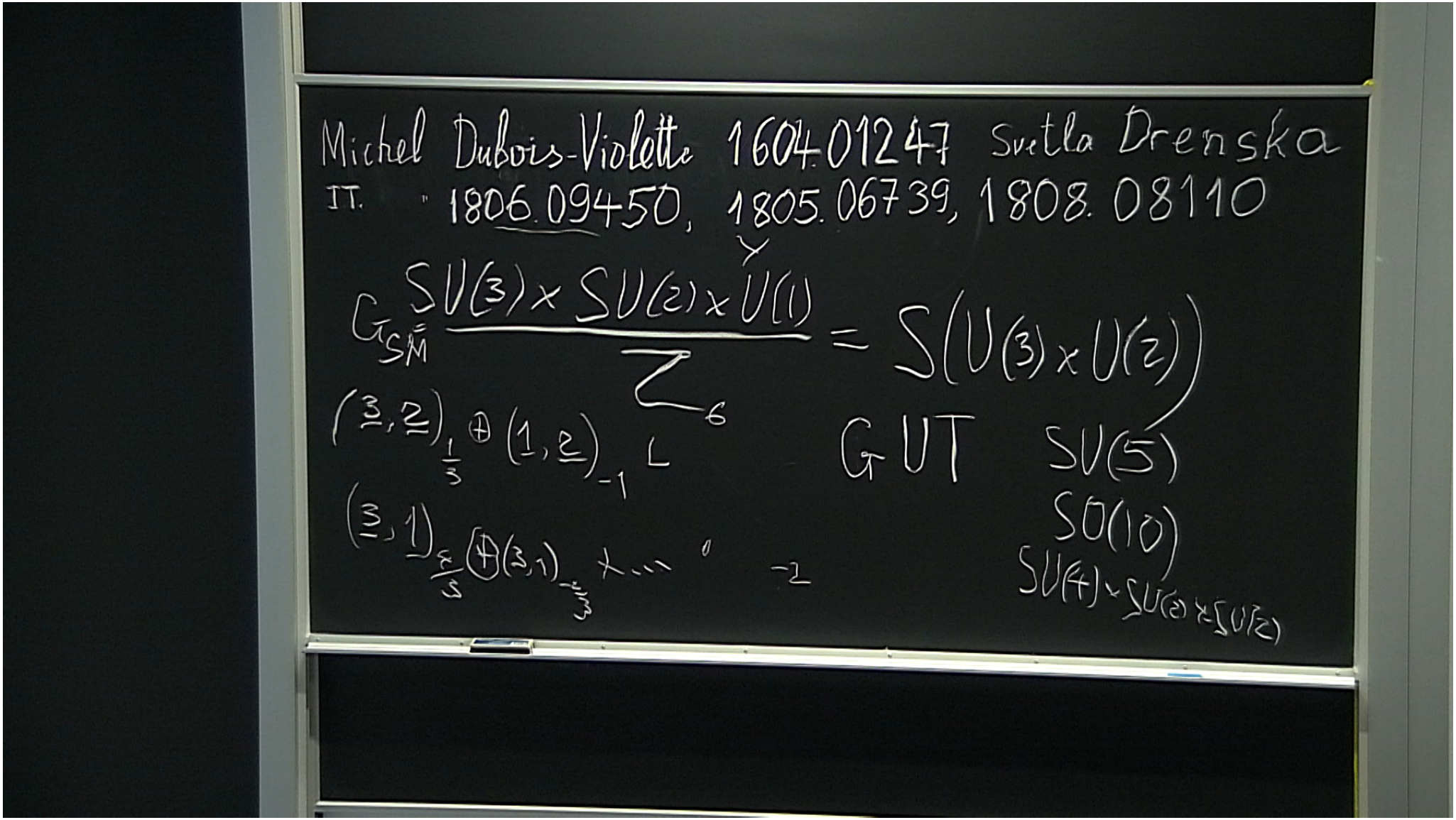
$x = z + Z$
$\frac{SU(3)_c \times SU_{ew}(3)}{Z_3} = F_4^{\omega} \subset F_4$
F_4
$J_2^8 \subset Cl_9$
$Spin(9)$
(U, V)
$VX(\xi, z)V^* + UZV^*$
10
$F_4^{\omega} \cap Spin(9)$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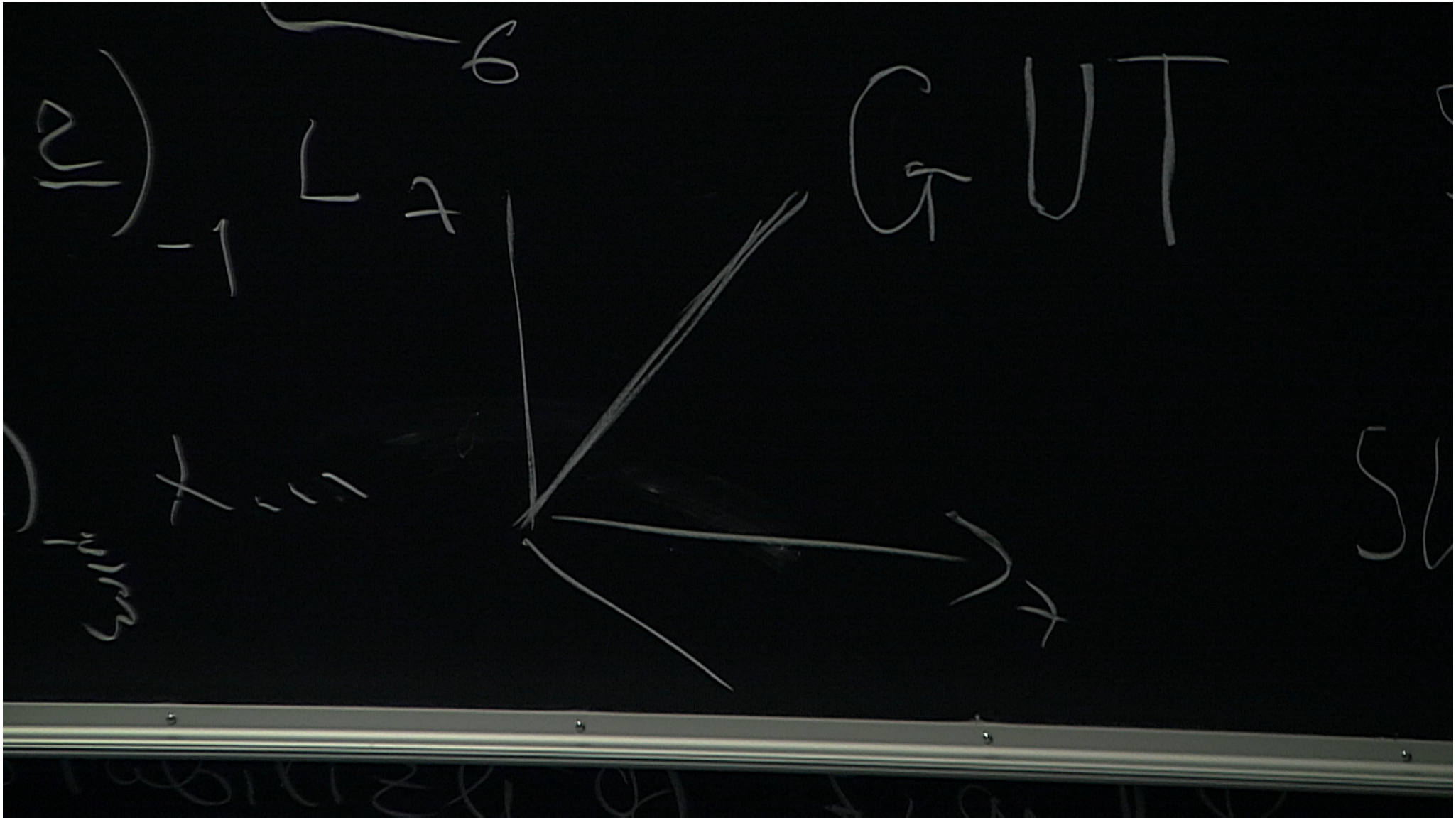
IT. " 1806.09450, 1805.06739, 1808.08110
$G_{SM} = \frac{SU(3) \times SU(2) \times U(1)}{Z_6} = S(U(3) \times U(2))$
$(\underline{3}, \underline{2})_{\frac{1}{3}} \oplus (\underline{1}, \underline{2})_{-1}$ L
$(\underline{3}, \underline{1})_{\frac{2}{3}} \oplus (\underline{3}, \underline{1})_{-\frac{1}{3}}$ ... 0 -2
GUT
SU(5)
SO(10)
SU(4) × SU(2) × SU(2)


6
GUT