Title: Scale invariant transfer matrices and Hamiltonians

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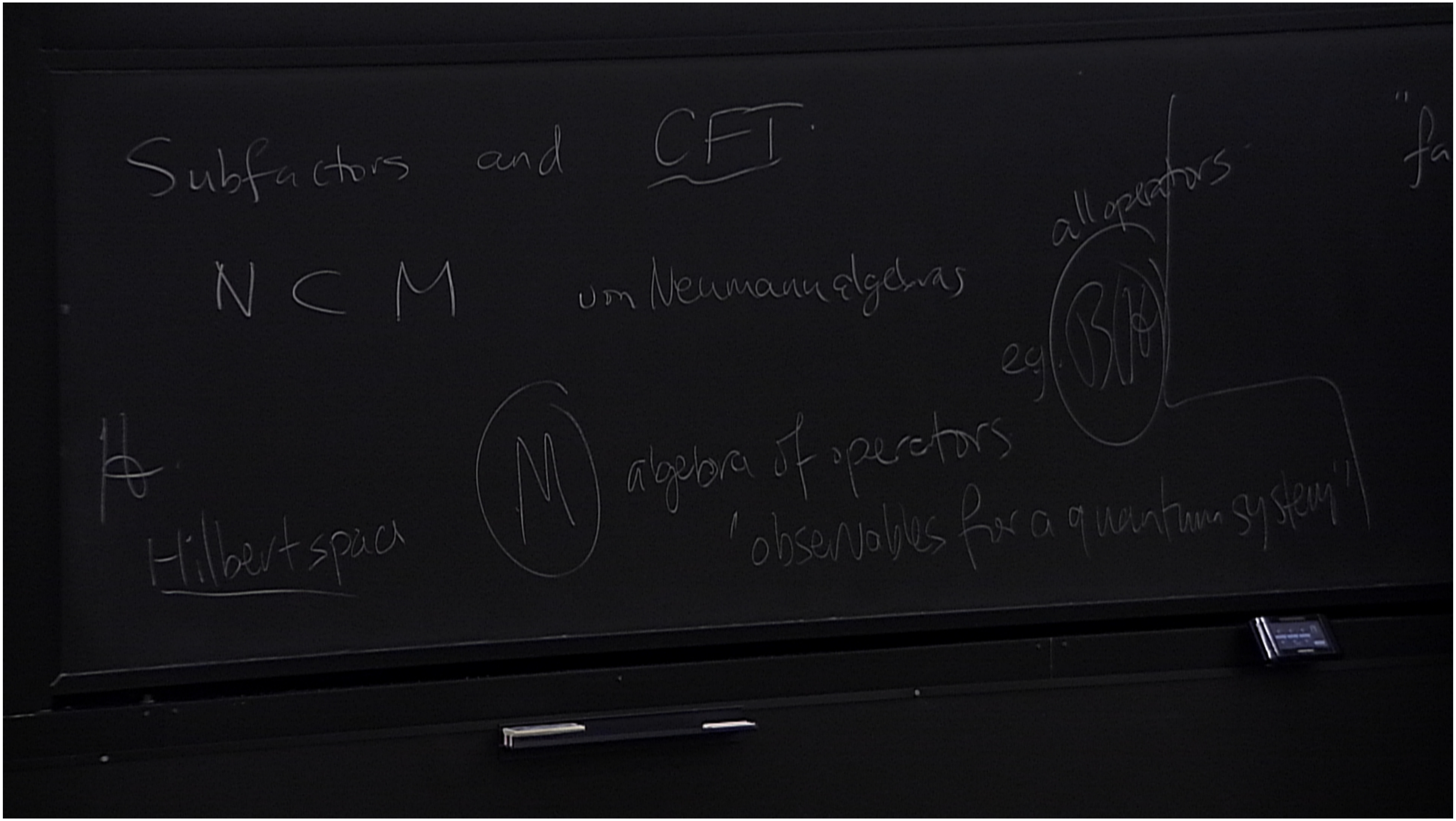
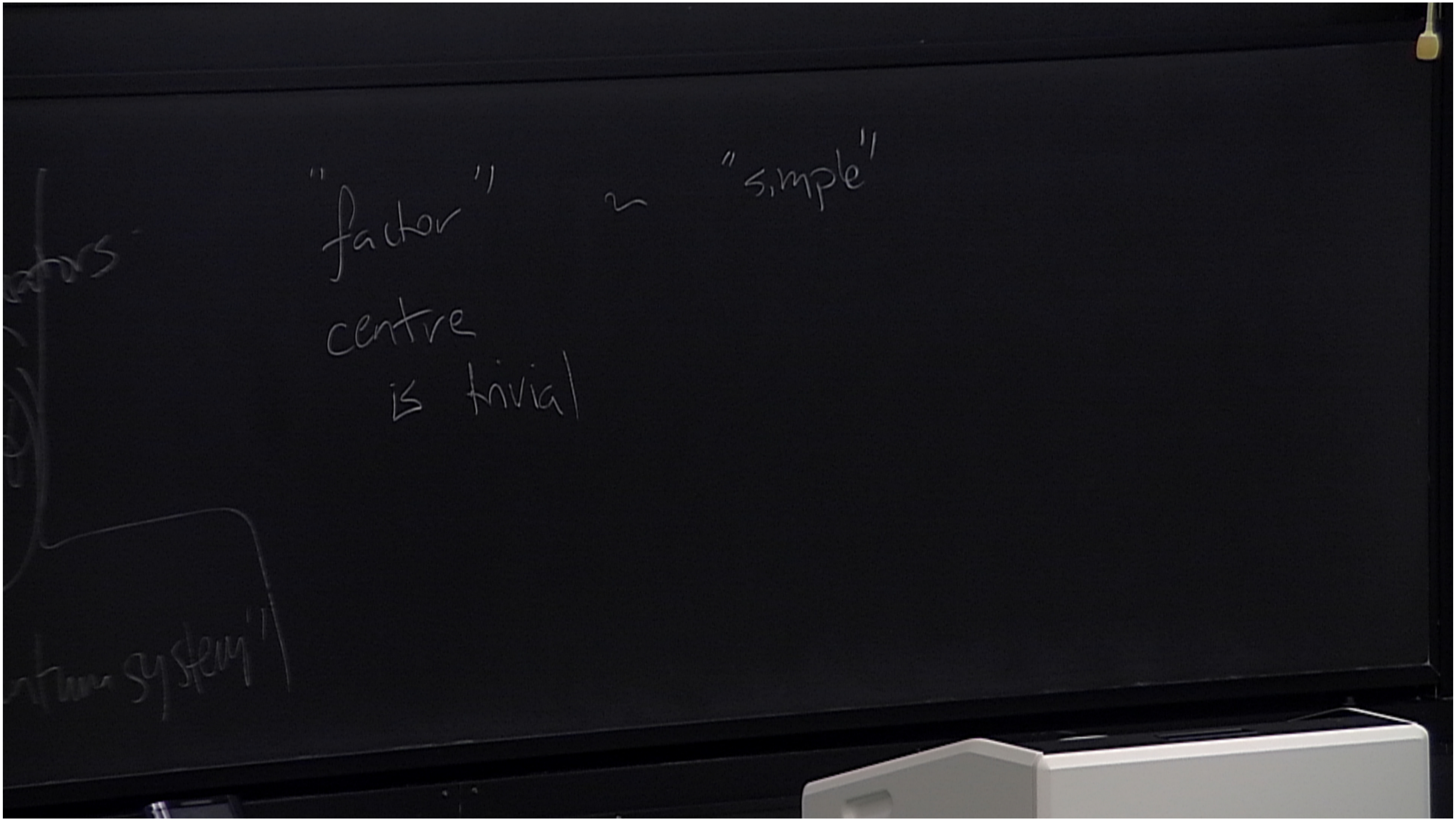
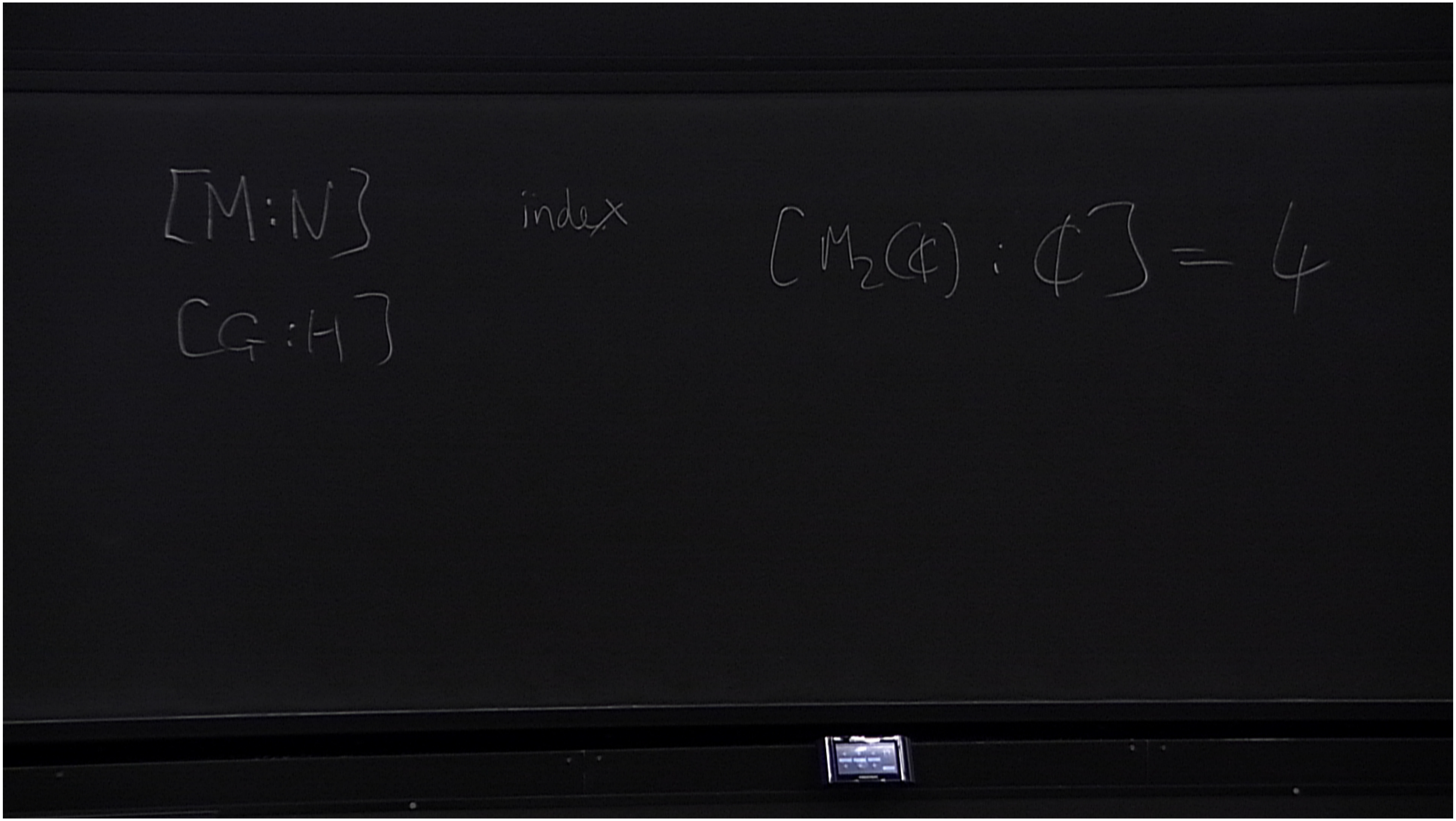
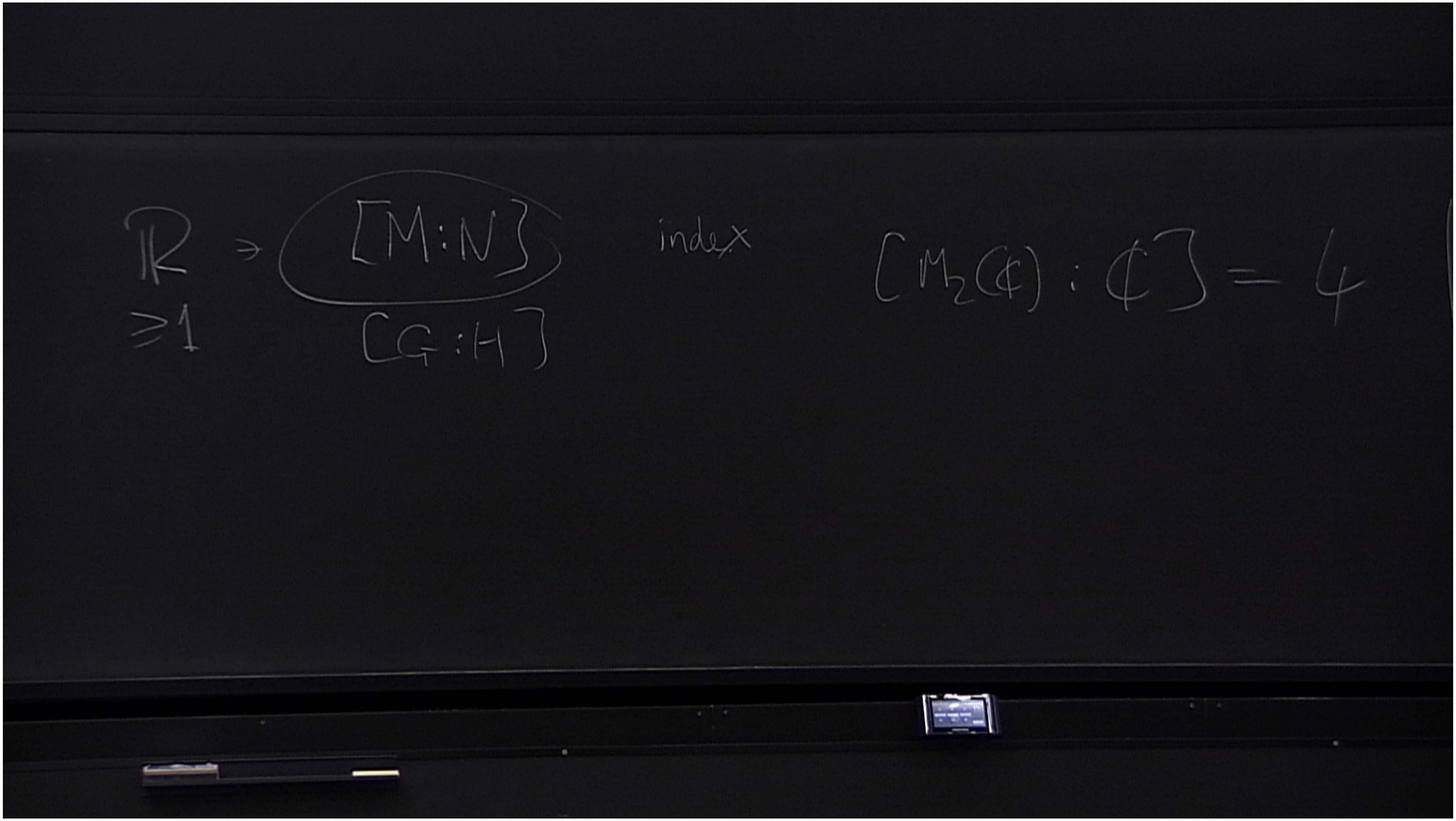
URL: http://pirsa.org/16110040

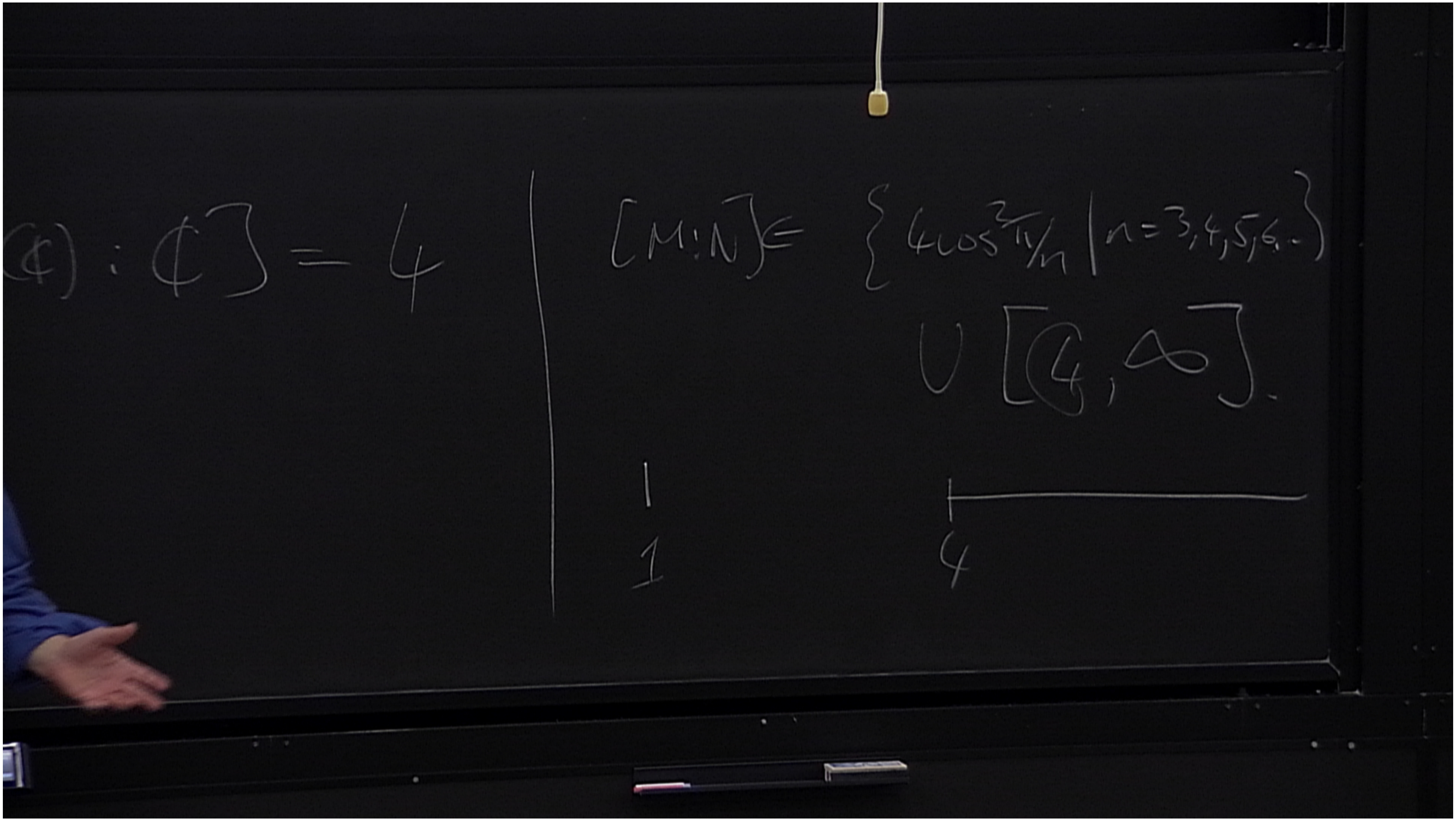
Abstract: <p>Scale invariant transfer matrices and Hamiltonians Abstract We investigate the possibility of strictly scale invariant transfer matrices in quantum spin chains based on a certain planar algebra, both as operators and as quadratic forms.</p>


Subfactors and CFT
N ⊂ M
von Neumann algebras
all operators
eg. B(H)
H
Hilbert spac
M
algebra of operators
"observables for a quantum system"


"factor" ~ "simple"
centre
is trivial


[M:N]
index
[G:H]
[M2(ℂ) : ℂ] = 4

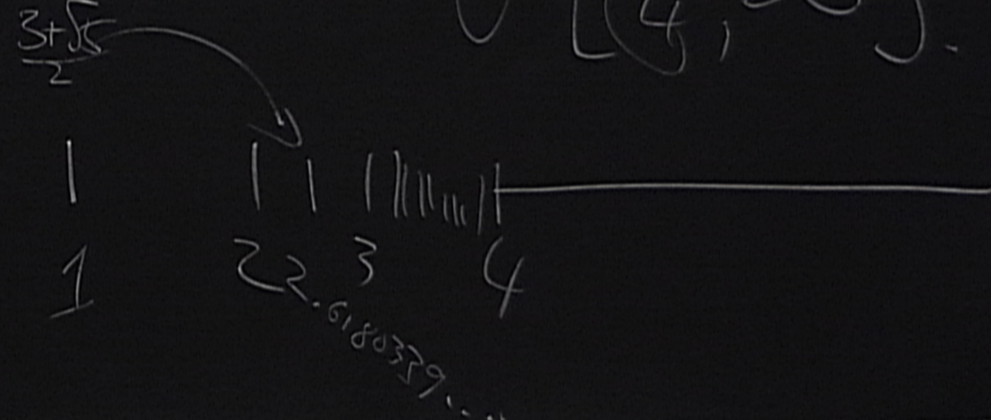

ℝ ⇒ [M:N]
≥1
[G:H]
index
[M₂(ℂ) : ℂ] = 4

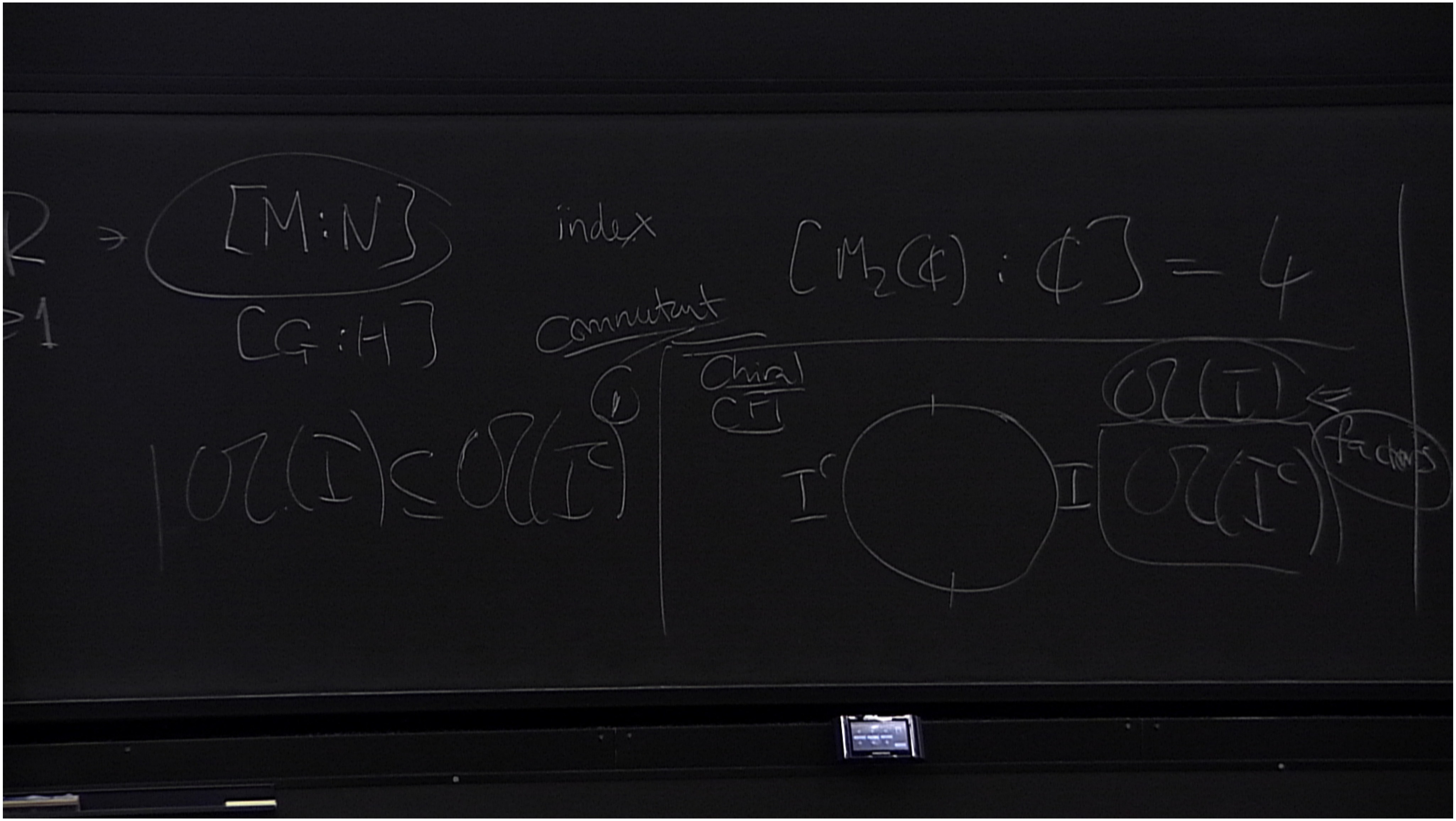

(ℂ) : ℂ] = 4
[M:N] ∈ {4cos² π/n | n=3,4,5,6...}
∪ [4, ∞].
1
1
4

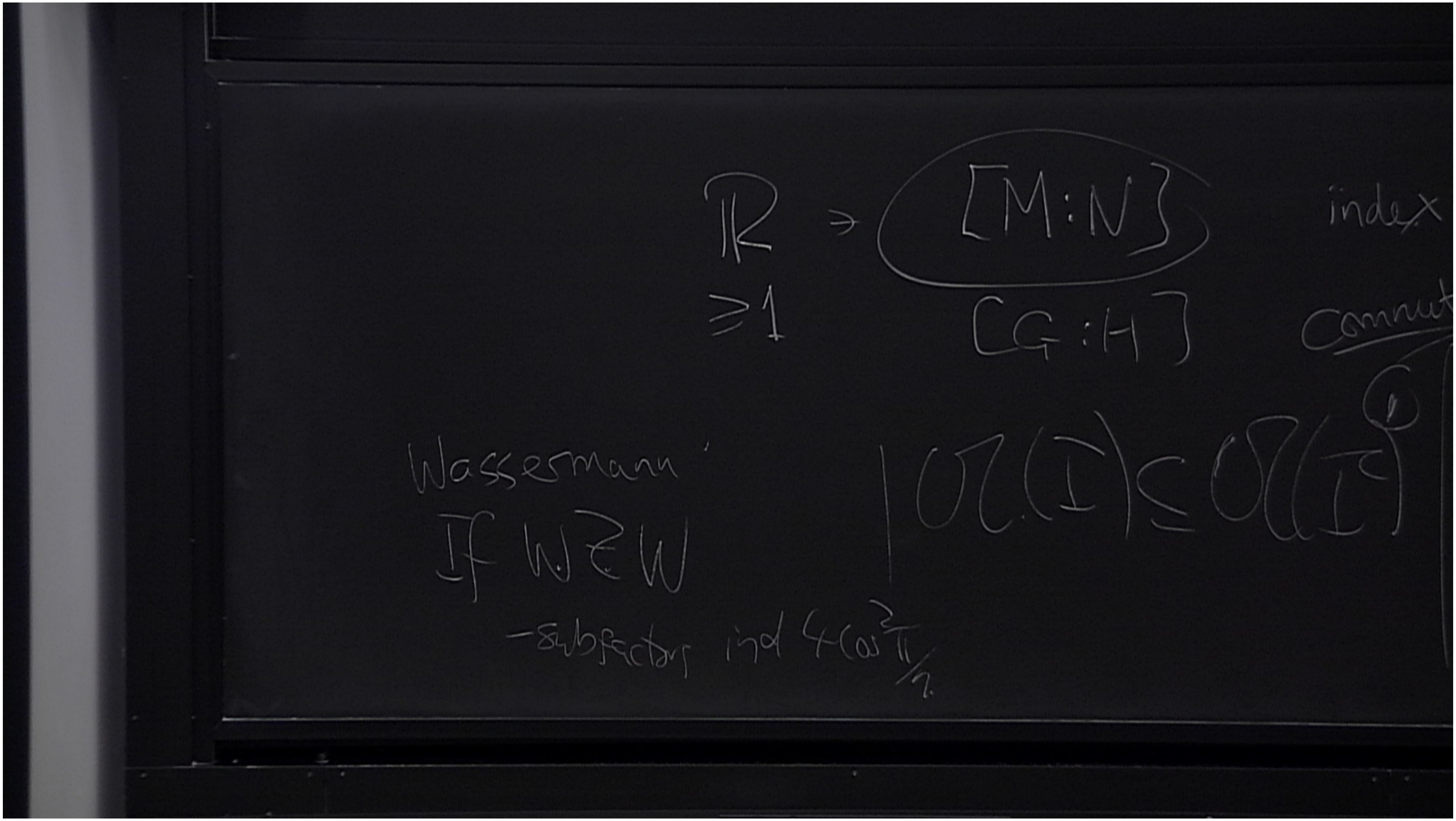
$(\mathbb{C}) : \mathbb{C}] = 4$

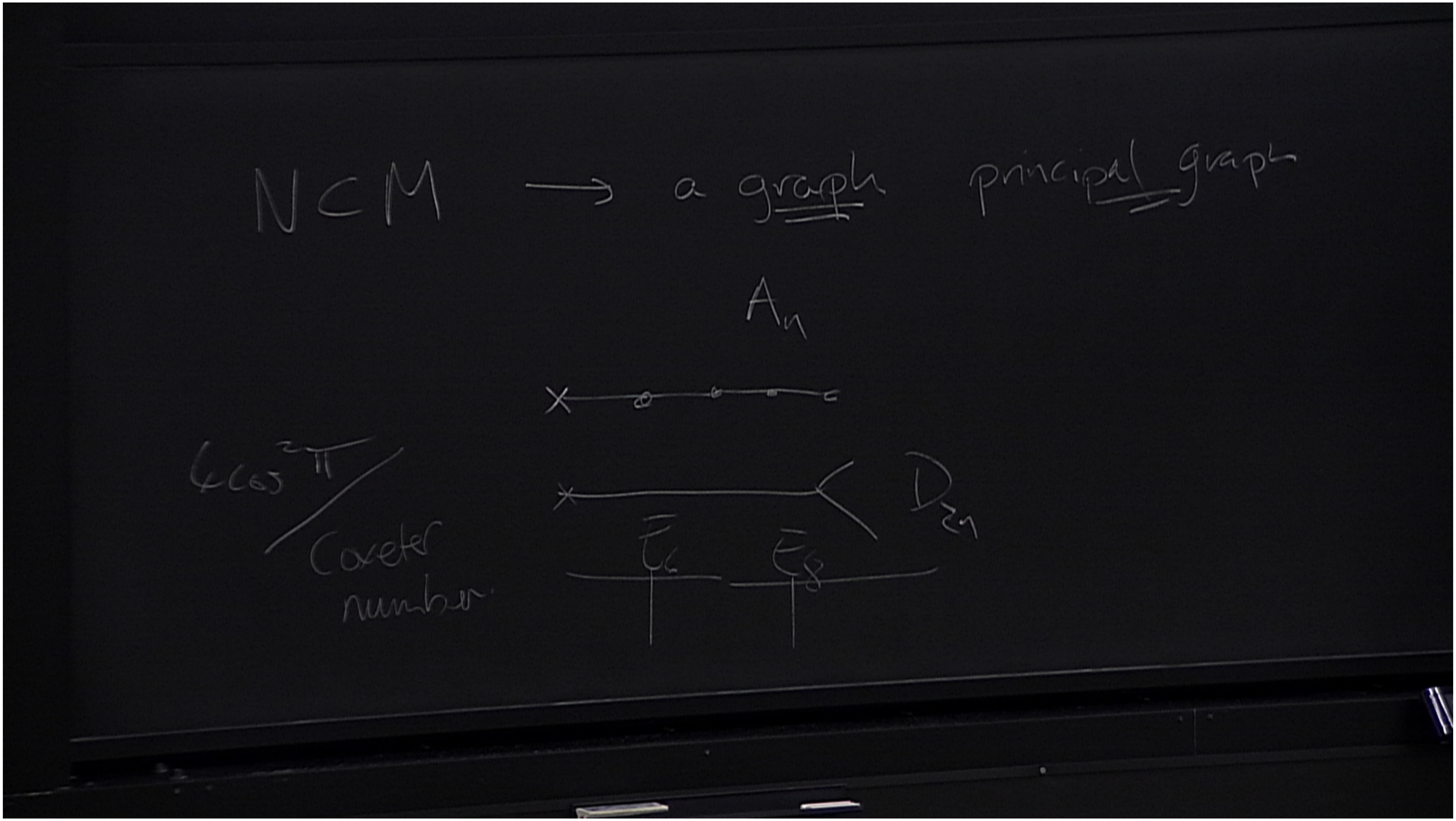
$[M:N] \in \{4\cos^2 \pi/n \mid n = 3,4,5,6,\dots\}$

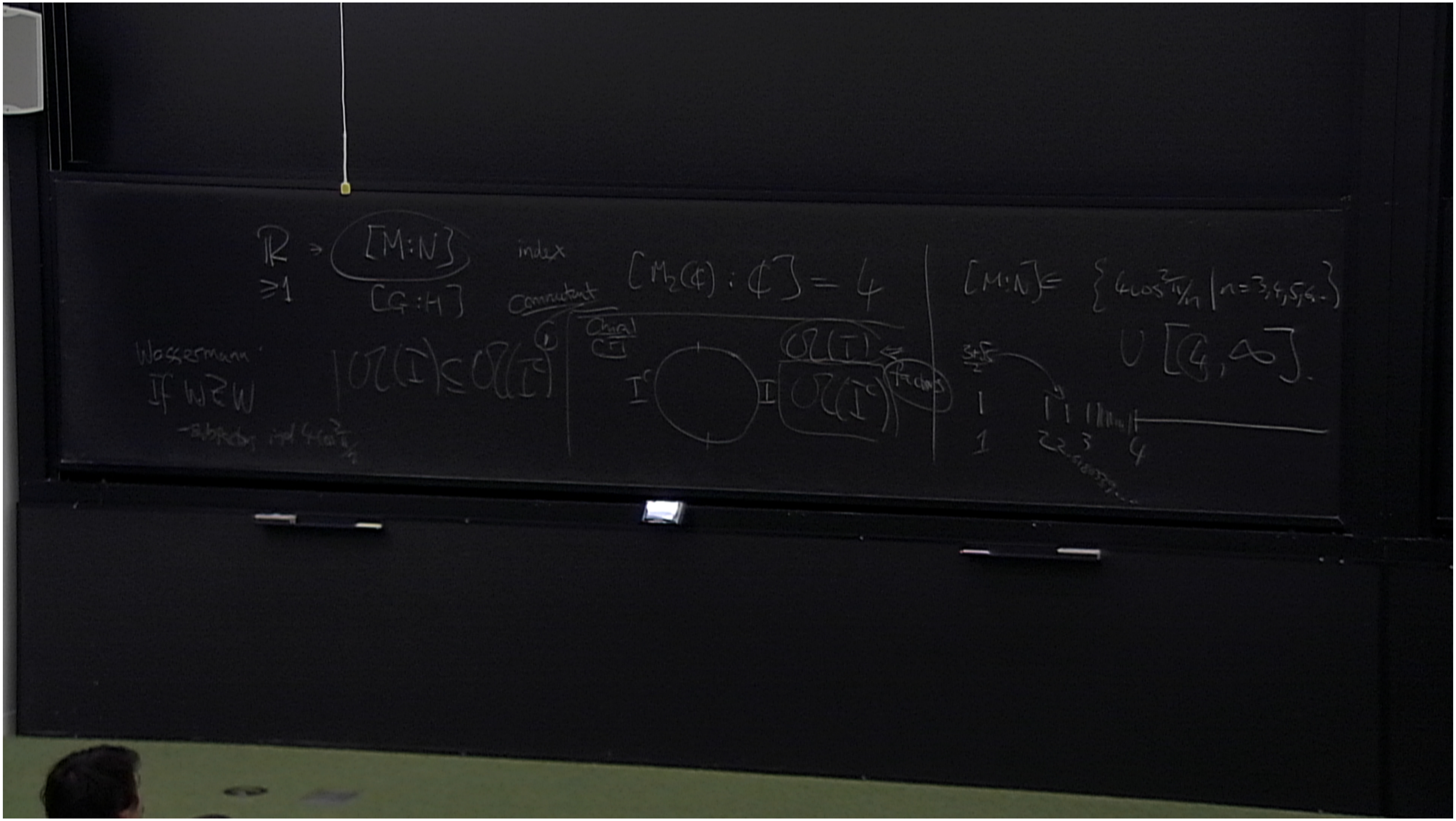
$\cup\ [4, \infty].$

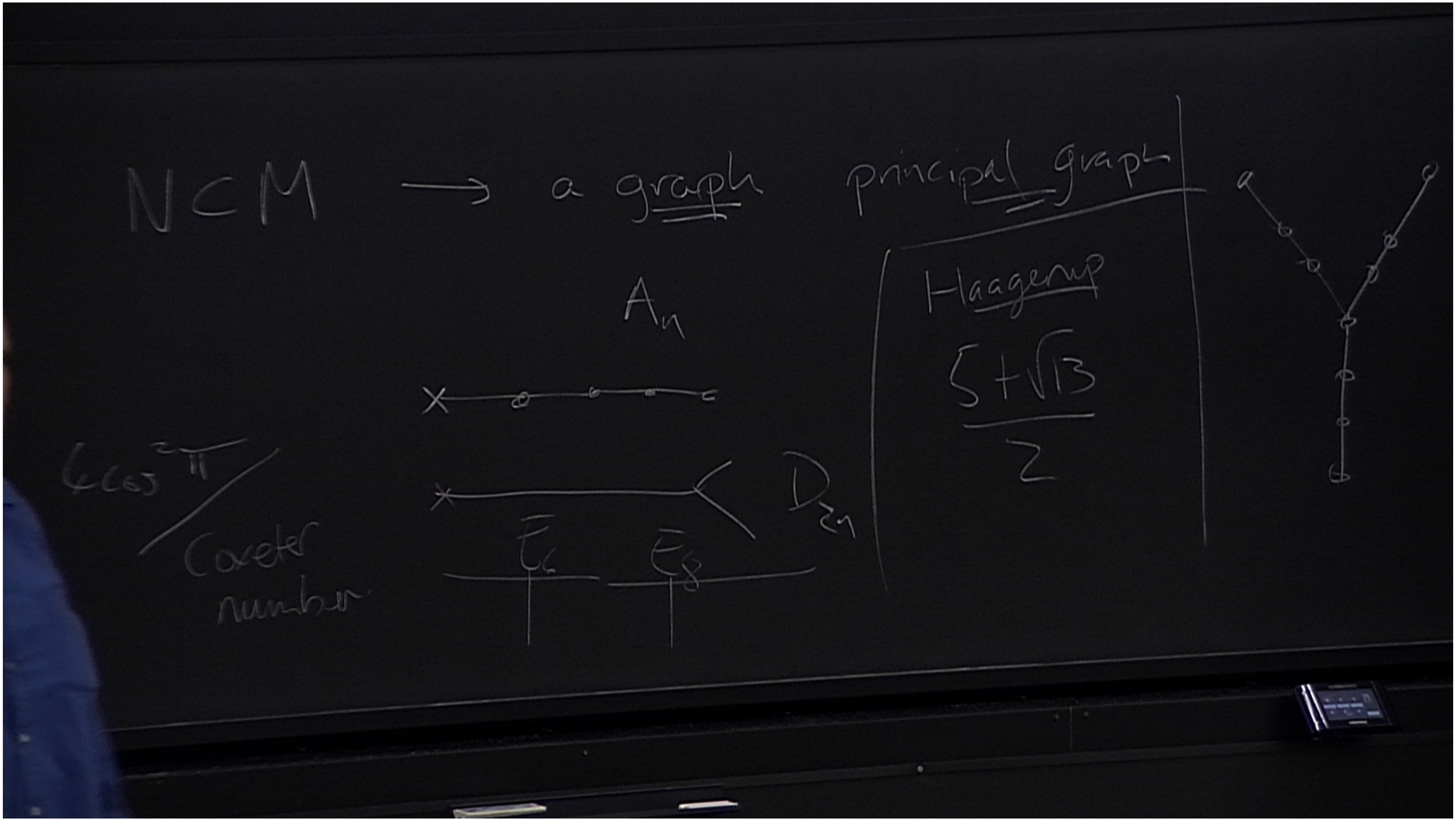


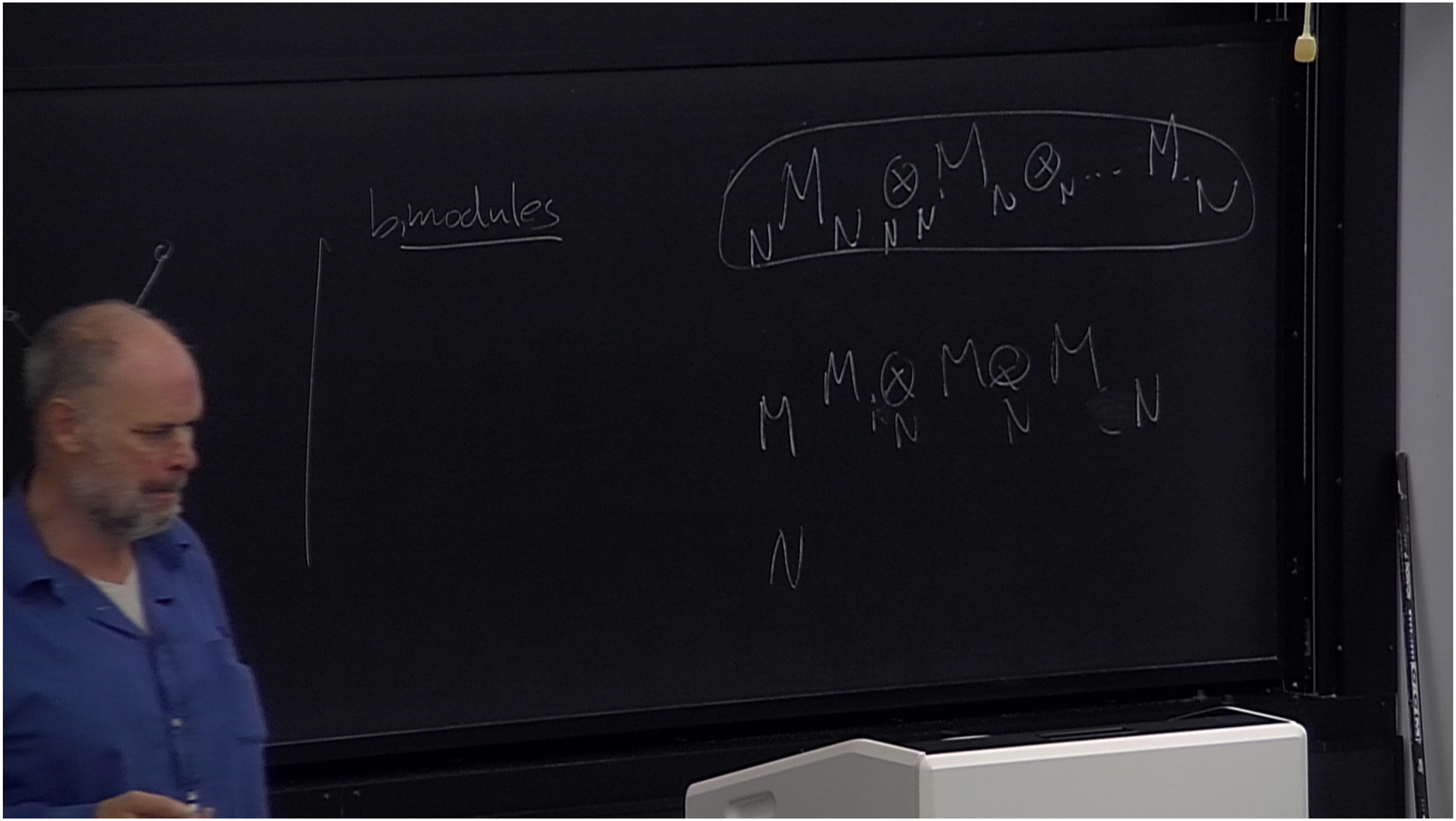

[M:N]
index
[G:H]
Commutant
[M2(C) : C] = 4
Chiral
CFT
factors


[M:N]
index
≥1
[G:H]
Wassermann
If WZW

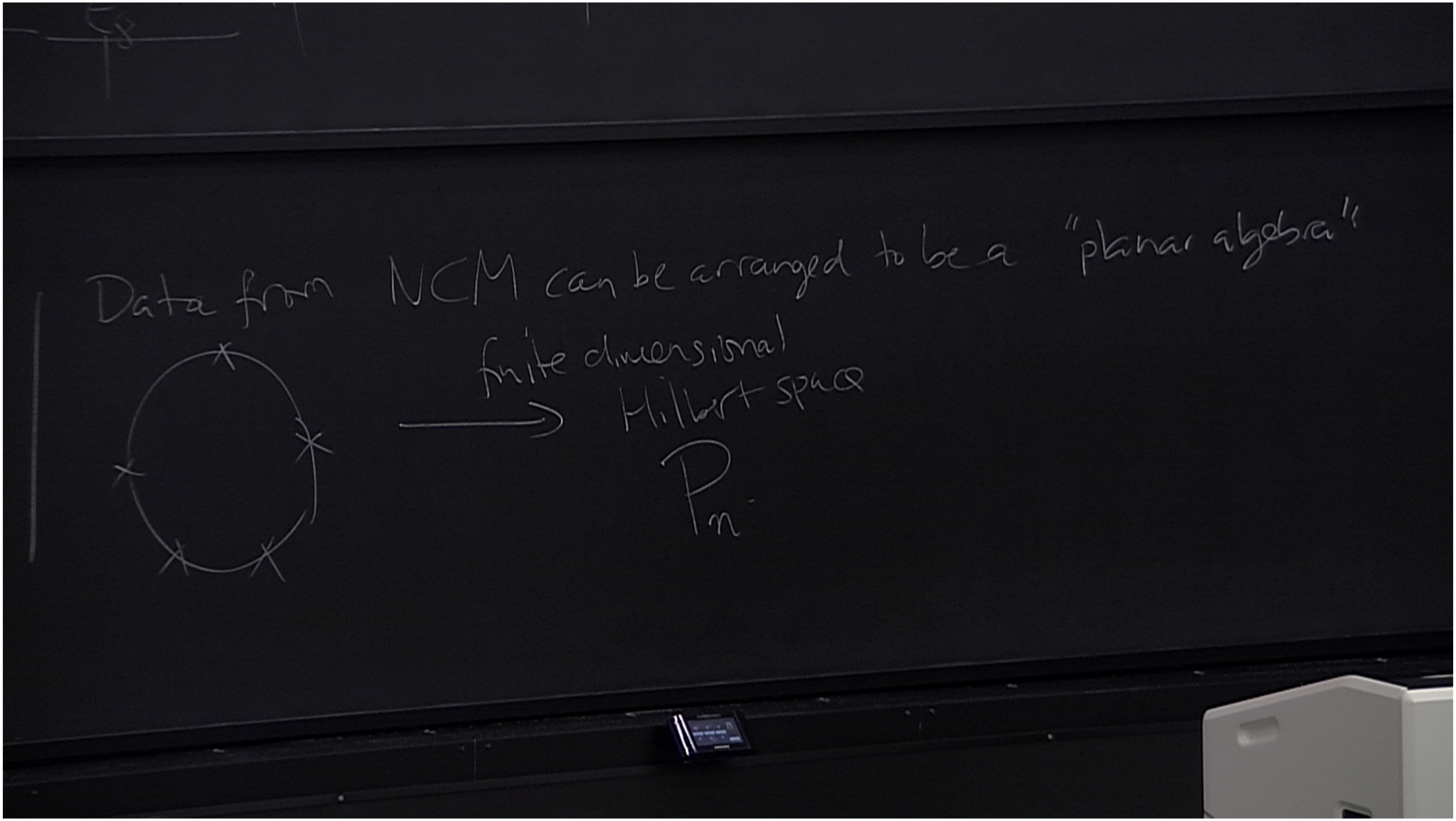

NCM → a graph
principal graph
A_n
4cos² π
Coxeter number
D_2n
E_6
E_8

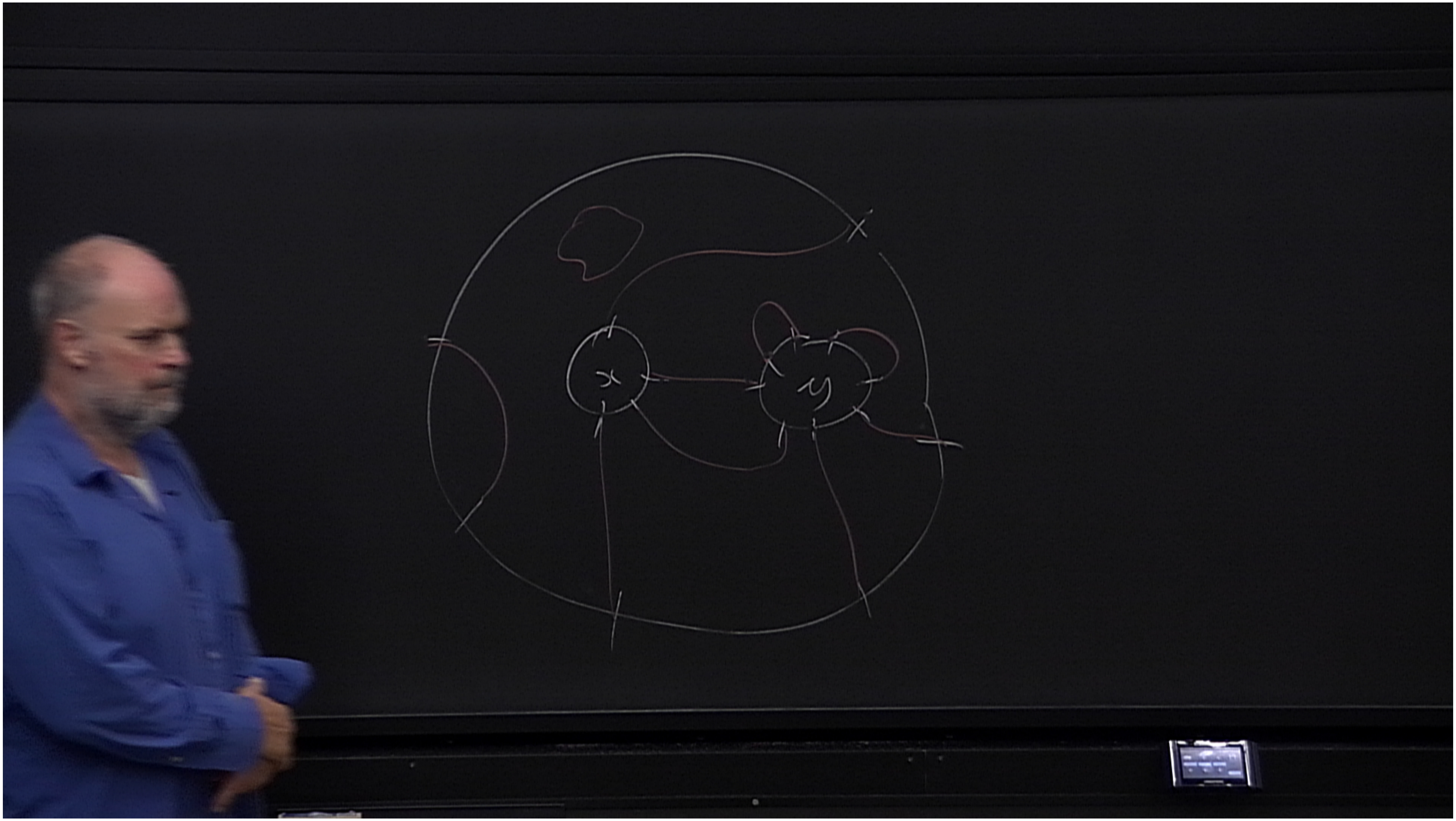

[M:N]
index
[G:H]
Commutant
Chiral CFT
[M₂(ℂ) : ℂ] = 4
Wassermann

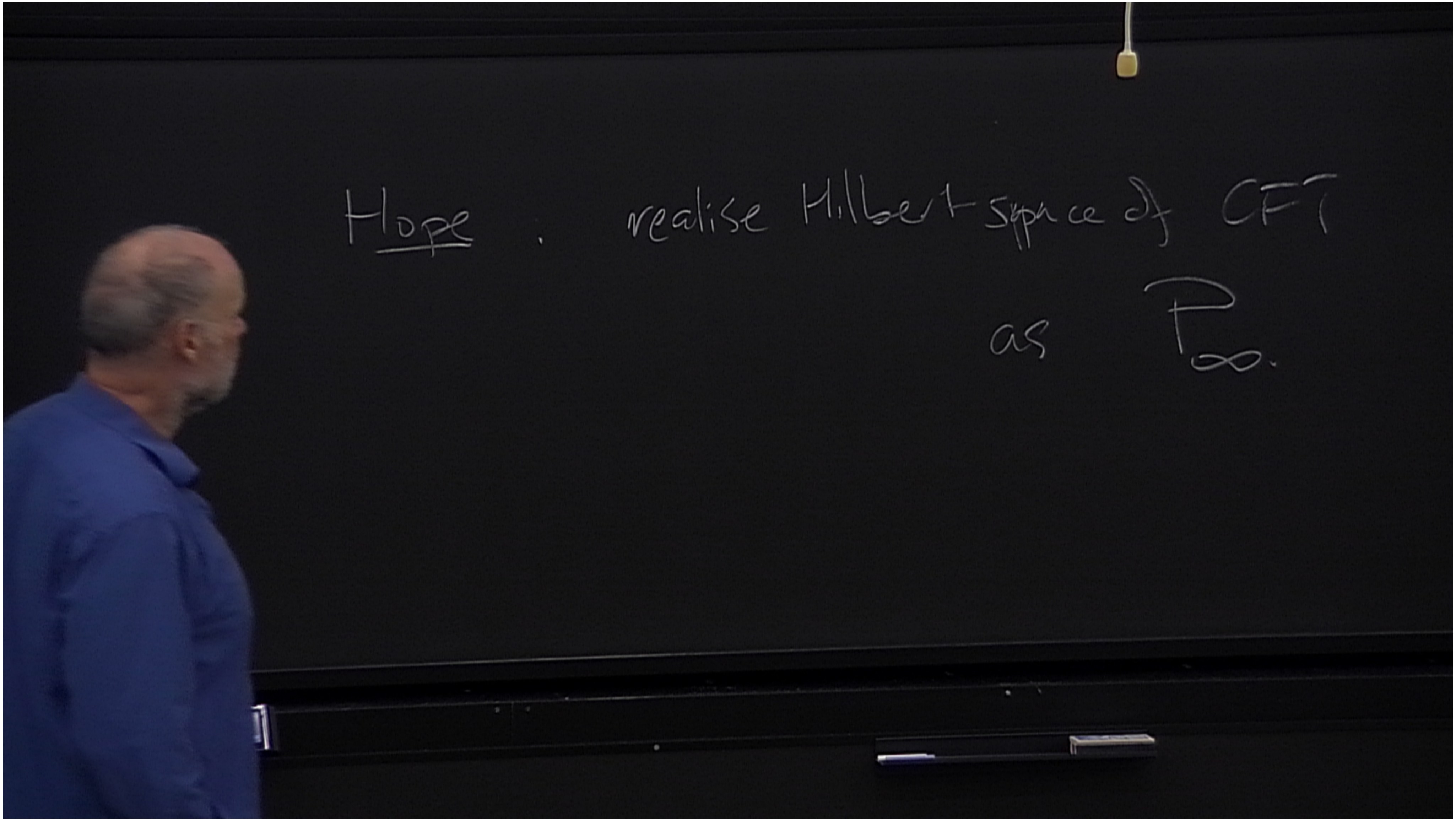

NCM → a graph
principal graph
Haagerup
5+√13
2
A_n
D_2n
E_6
E_8
Coxeter
number

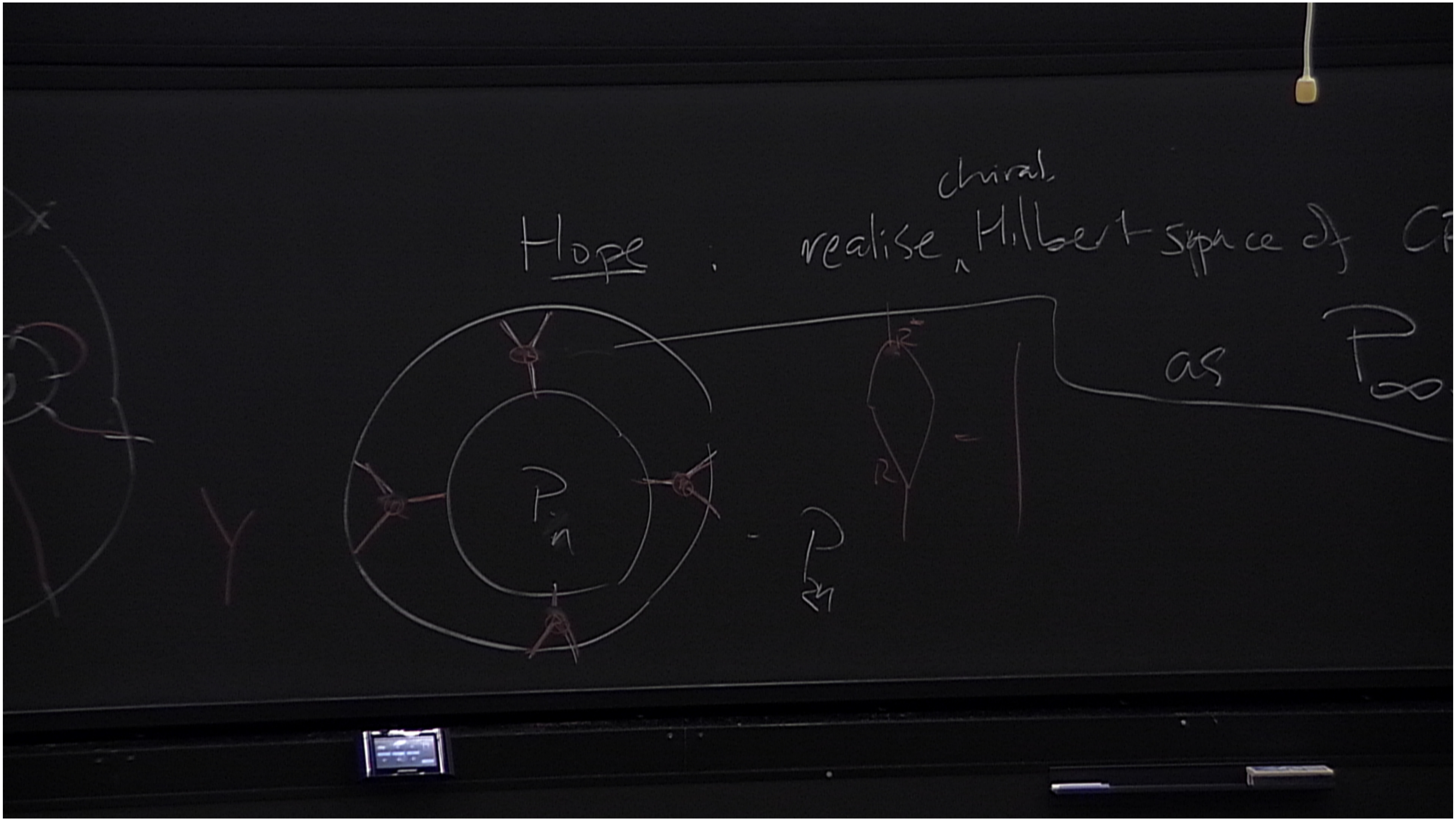

bimodules

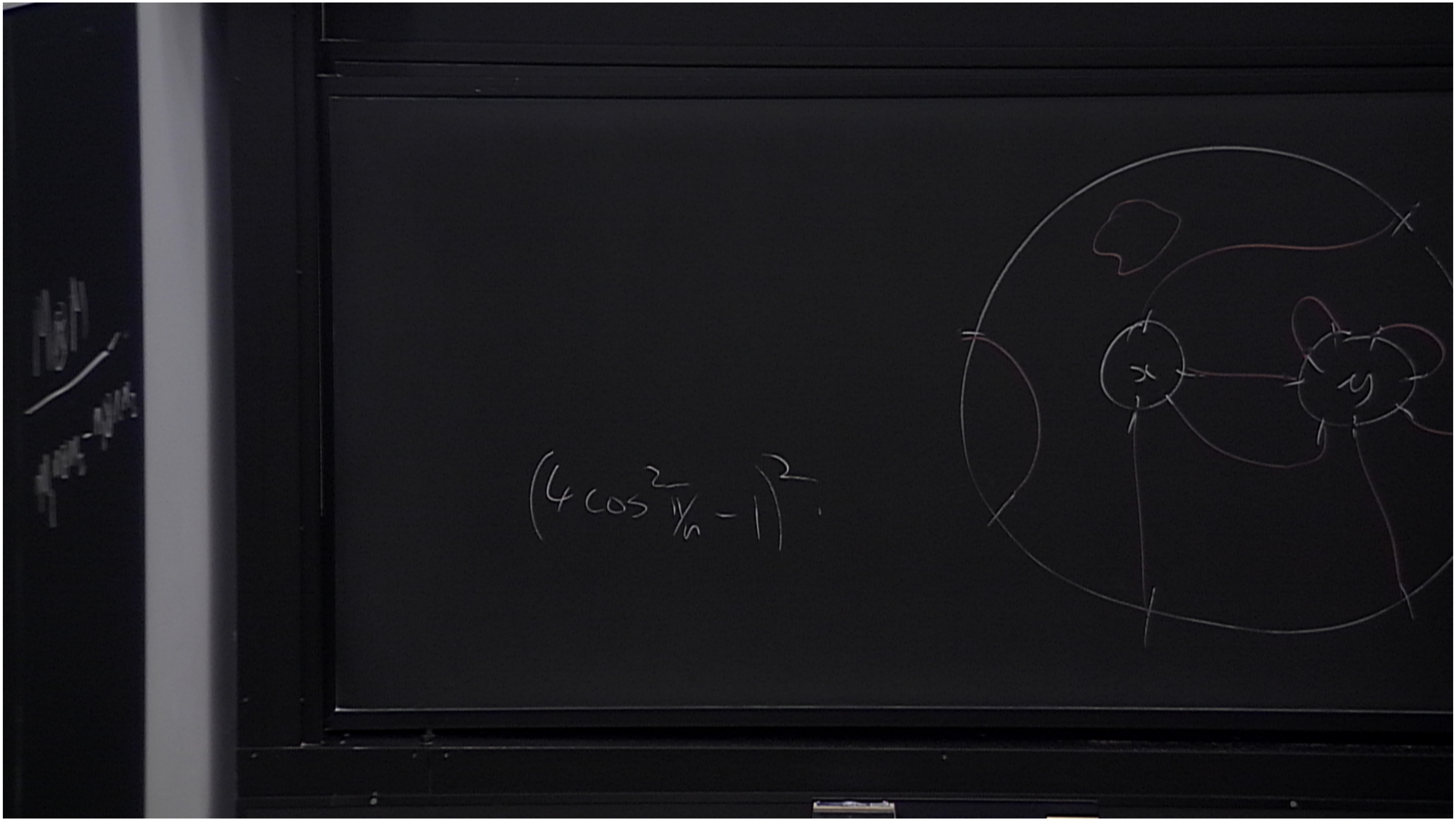
$$M \otimes_N M = \frac{M \otimes M}{m_1 n \otimes m_2 - m_1 \otimes n m_2}$$


Data from NCM can be arranged to be a "planar algebra"
finite dimensional
Hilbert space
Pn

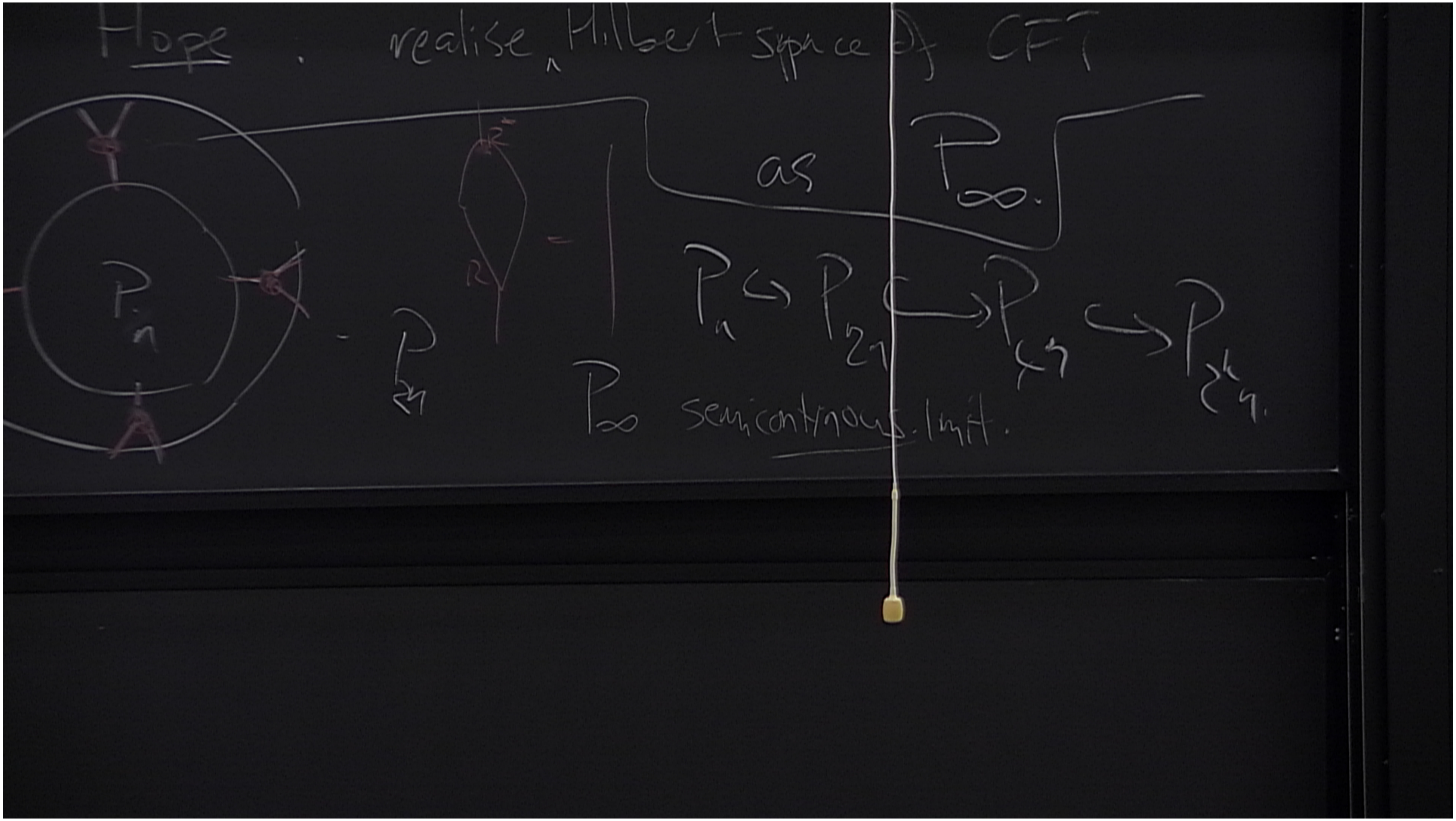

x
y

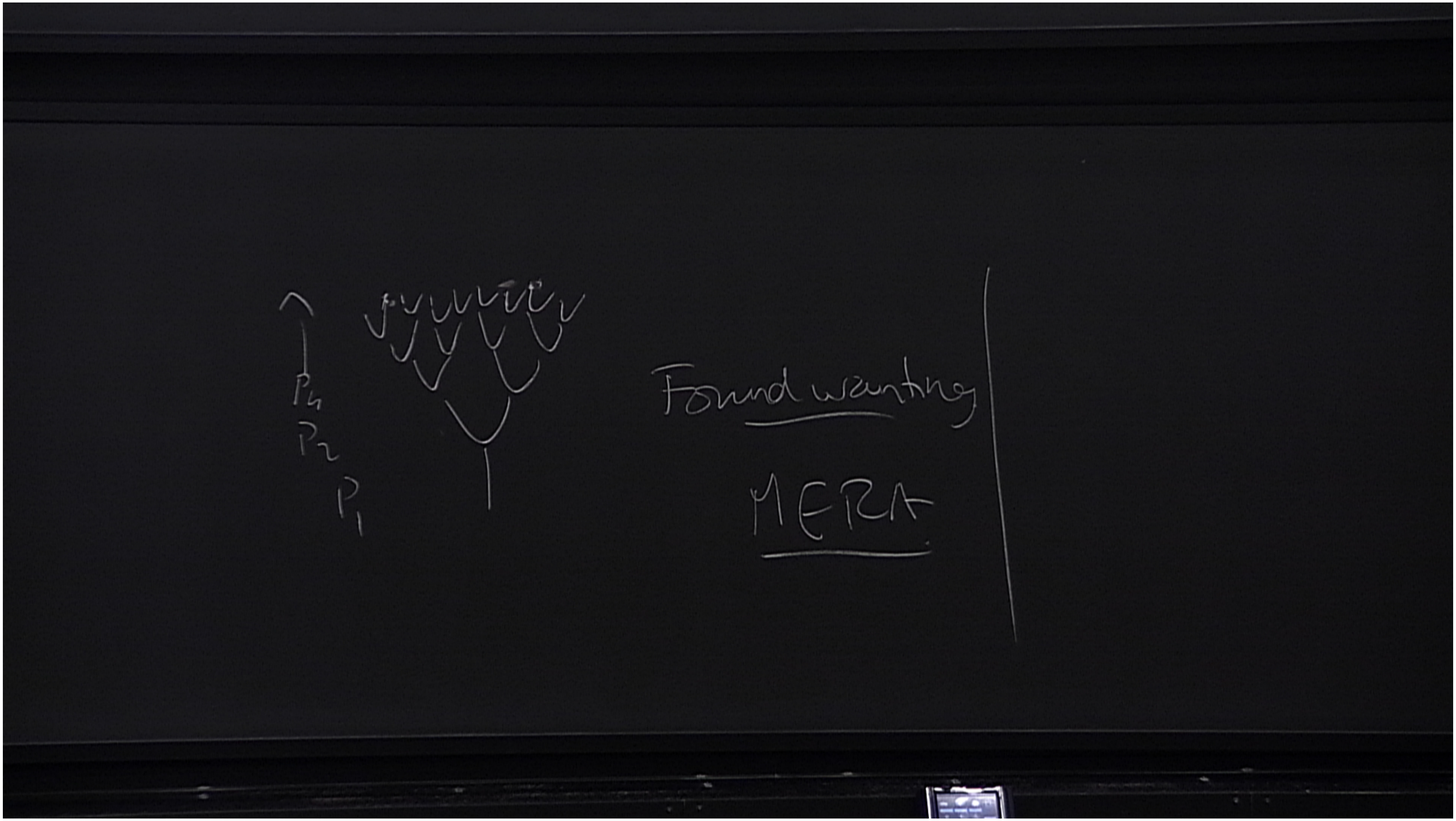

Hope : realise Hilbert space of CFT
as P_∞.

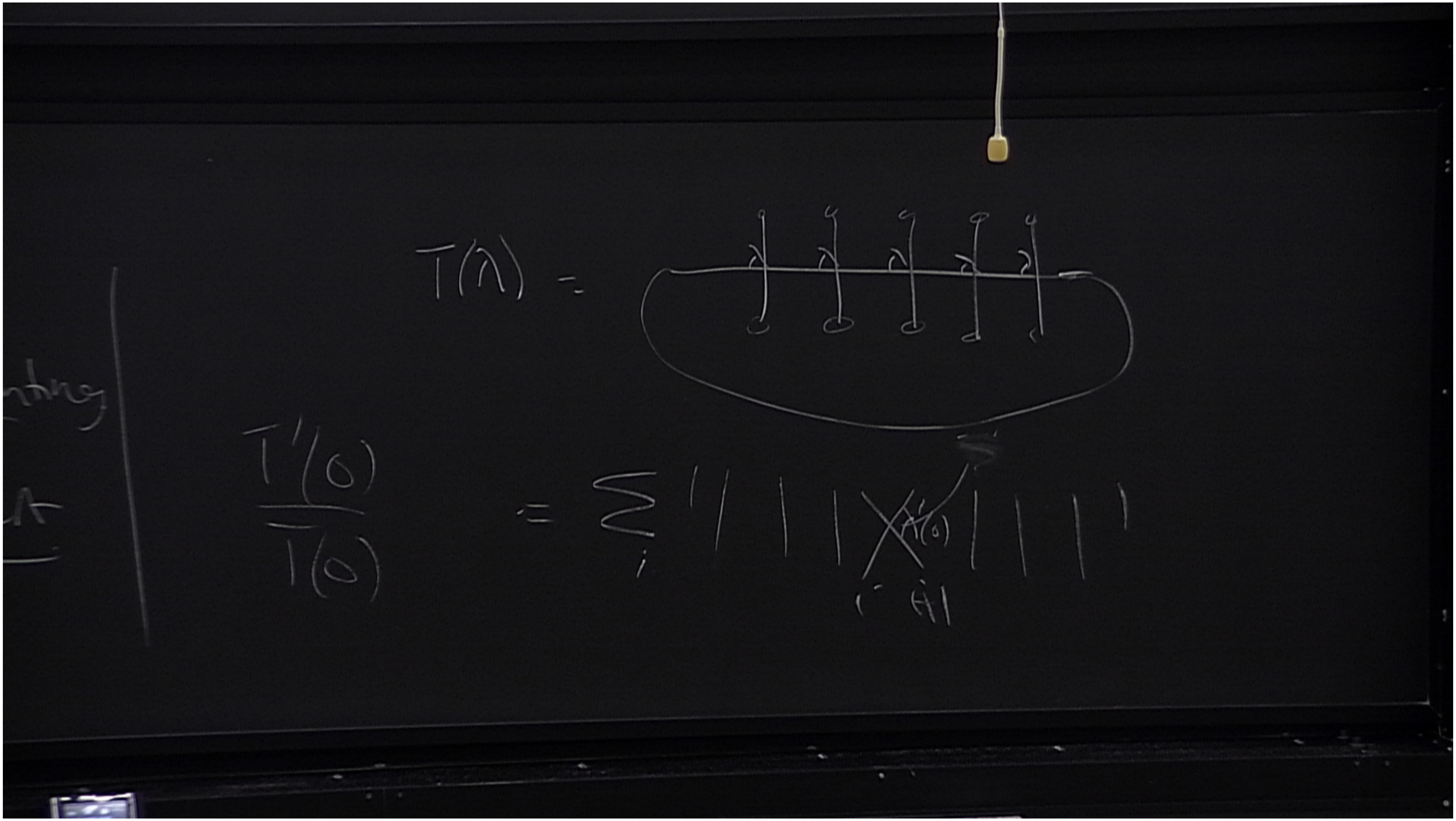

chiral
Hope : realise Hilbert space of CF
as
P
R
R

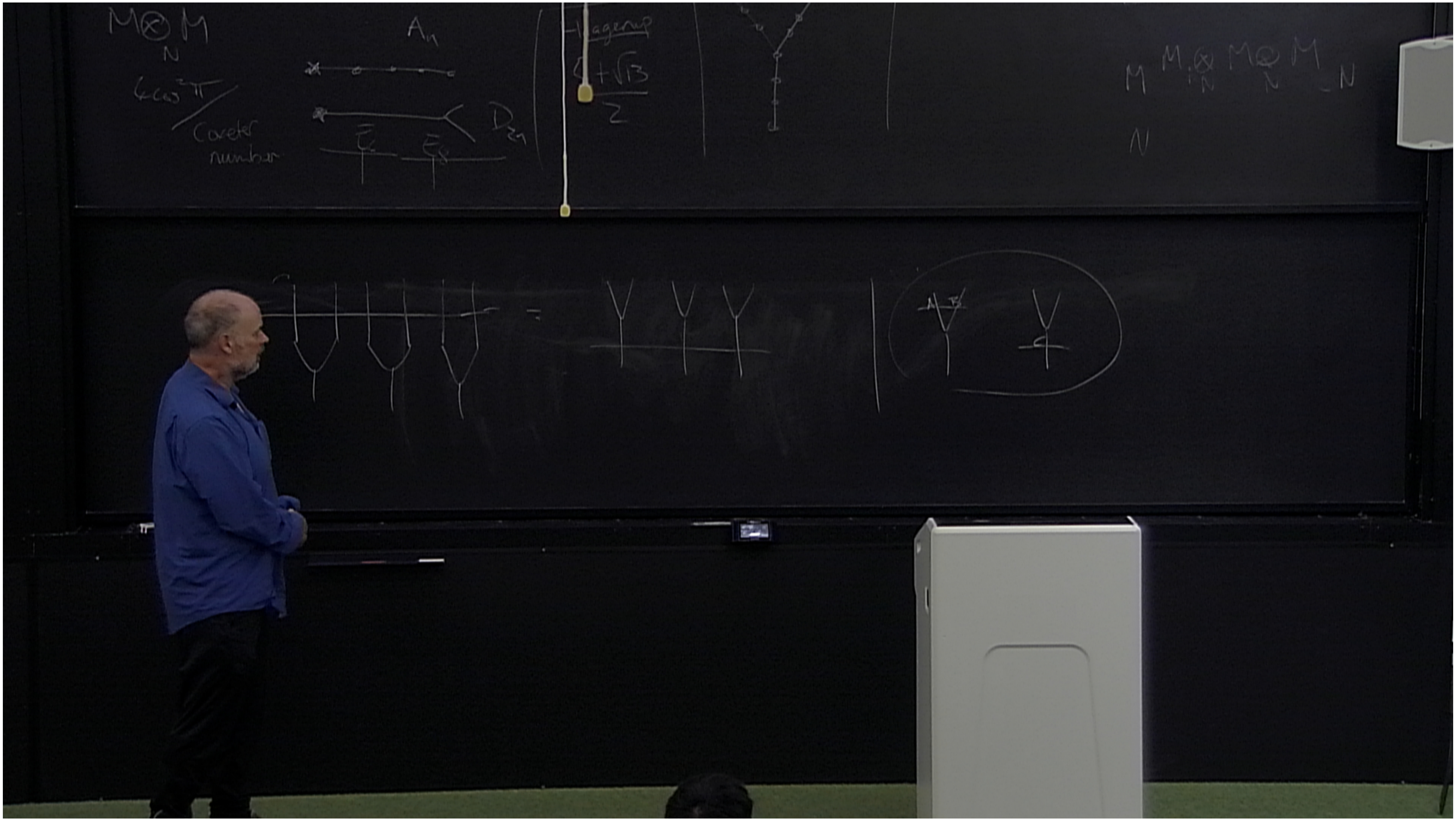


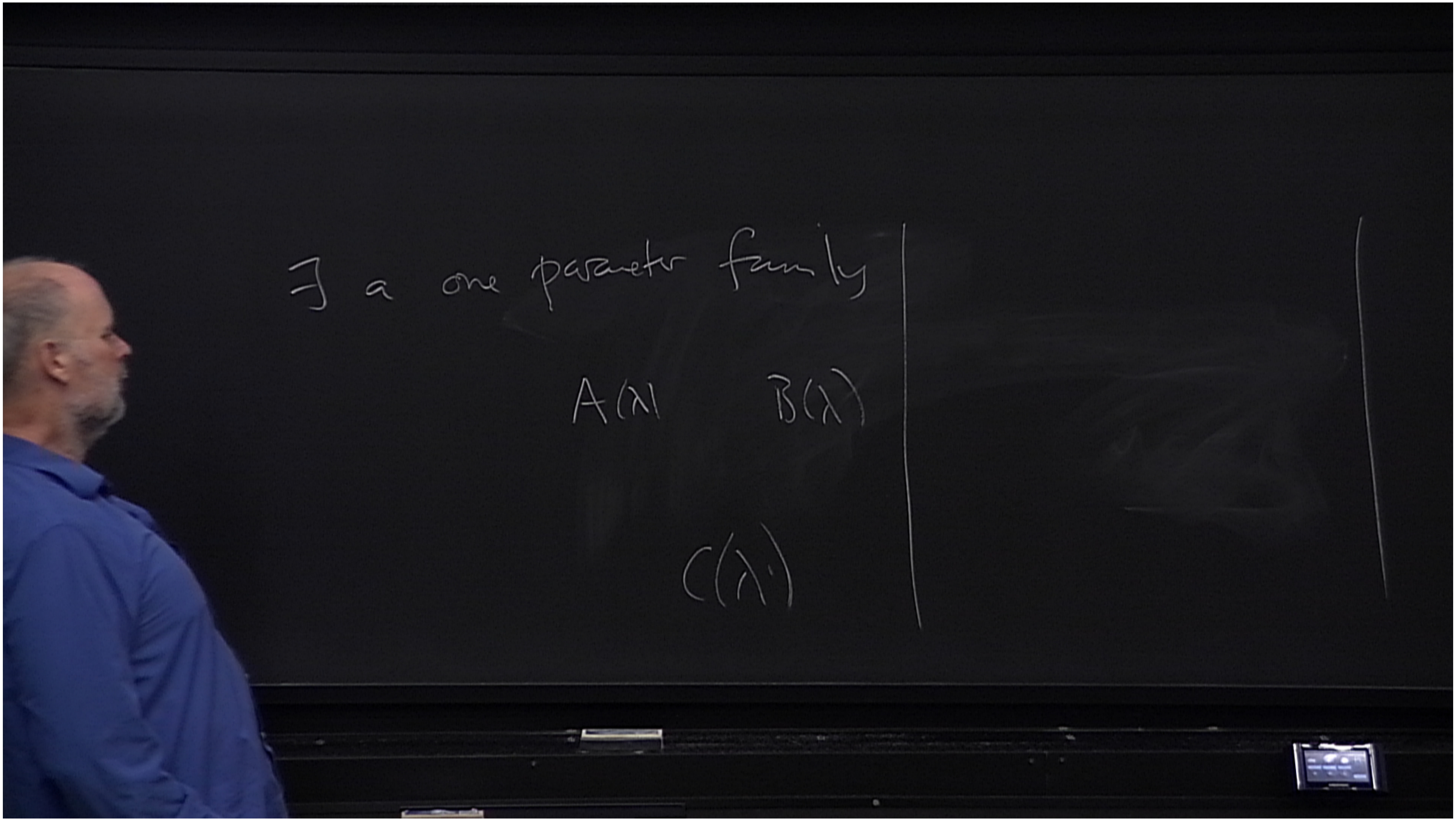
$(4\cos^2 \pi/n - 1)^2$.
x
y

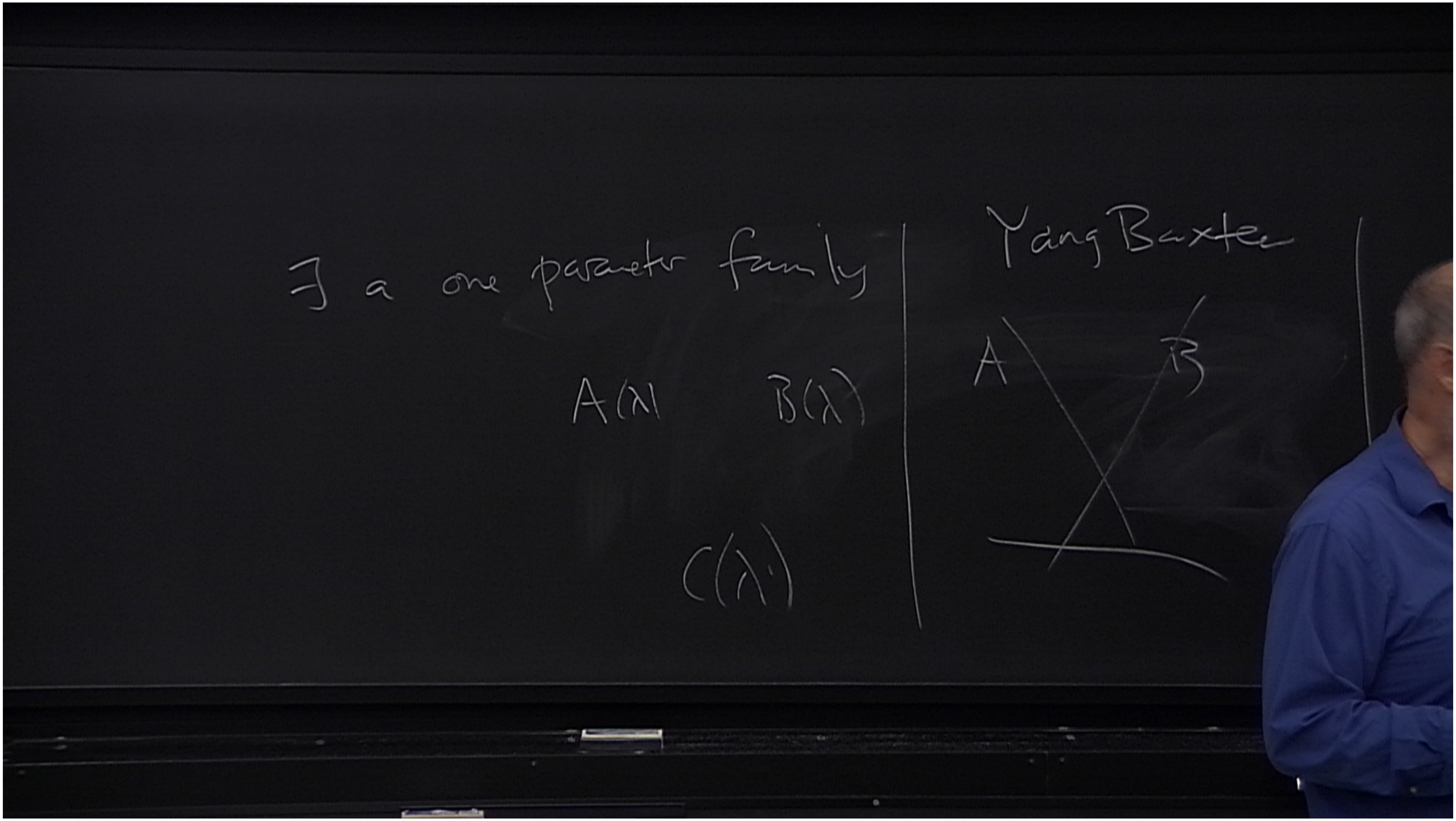

Hope: realise Hilbert space of CFT as P_∞.
$P_n \hookrightarrow P_{2n} \hookrightarrow P_{4n} \hookrightarrow P_{2^k n}$.
P_∞ semicontinuous limit.

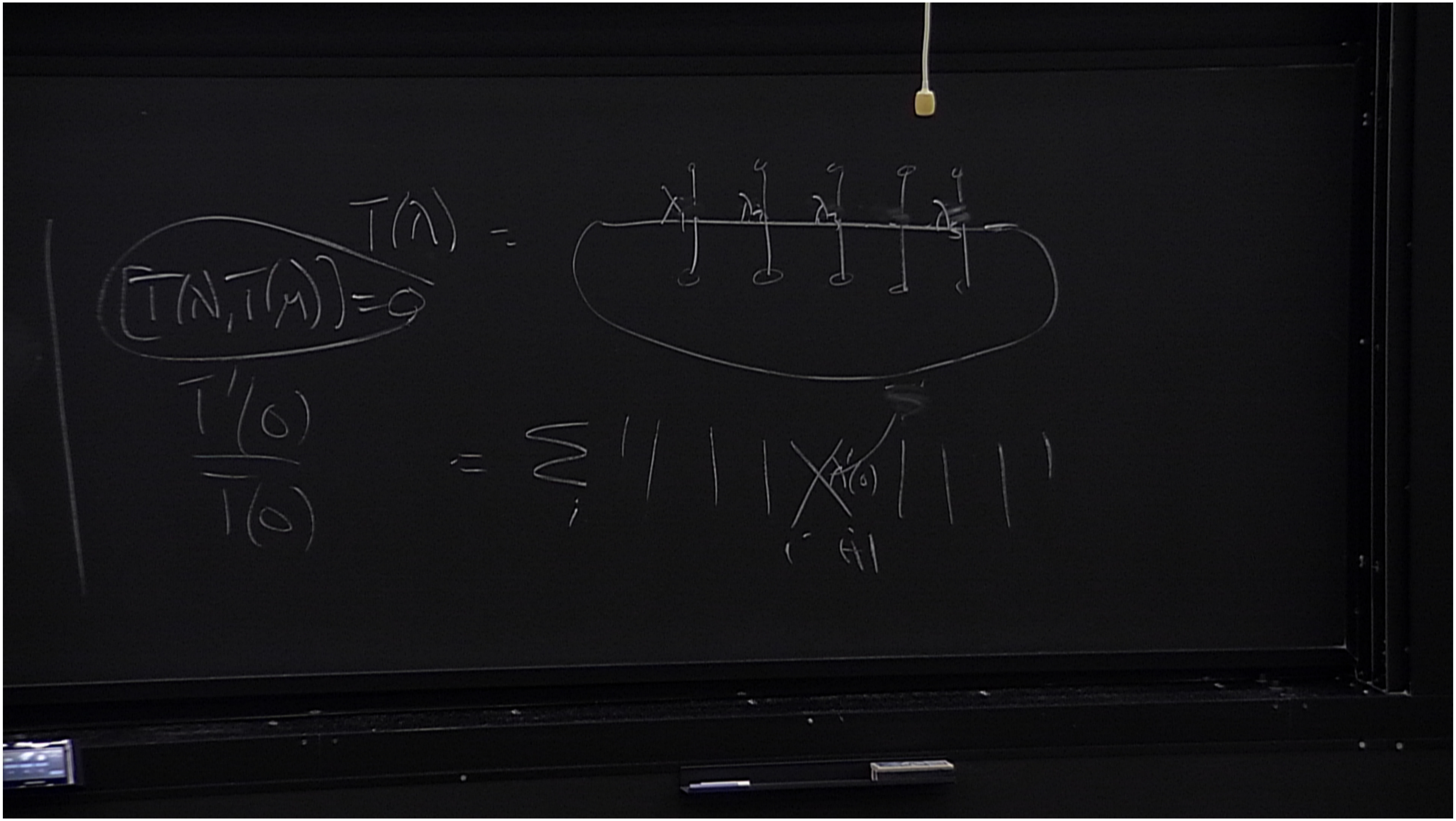

Found wanting
MERA


T(λ) =
T'(0)
T(0)
=


Coxeter number
Hagerup


∃ a one parameter family
A(λ)
B(λ)
C(λ)


∃ a one parameter family
A(λ)
B(λ)
C(λ)
Yang Baxter
A
B


T(λ) =
[T(λ), T(μ)] = 0
T'(0) / T(0) = Σ_i