Title: The Search for the Perfect Language

Date: Sep 21, 2009 02:00 PM

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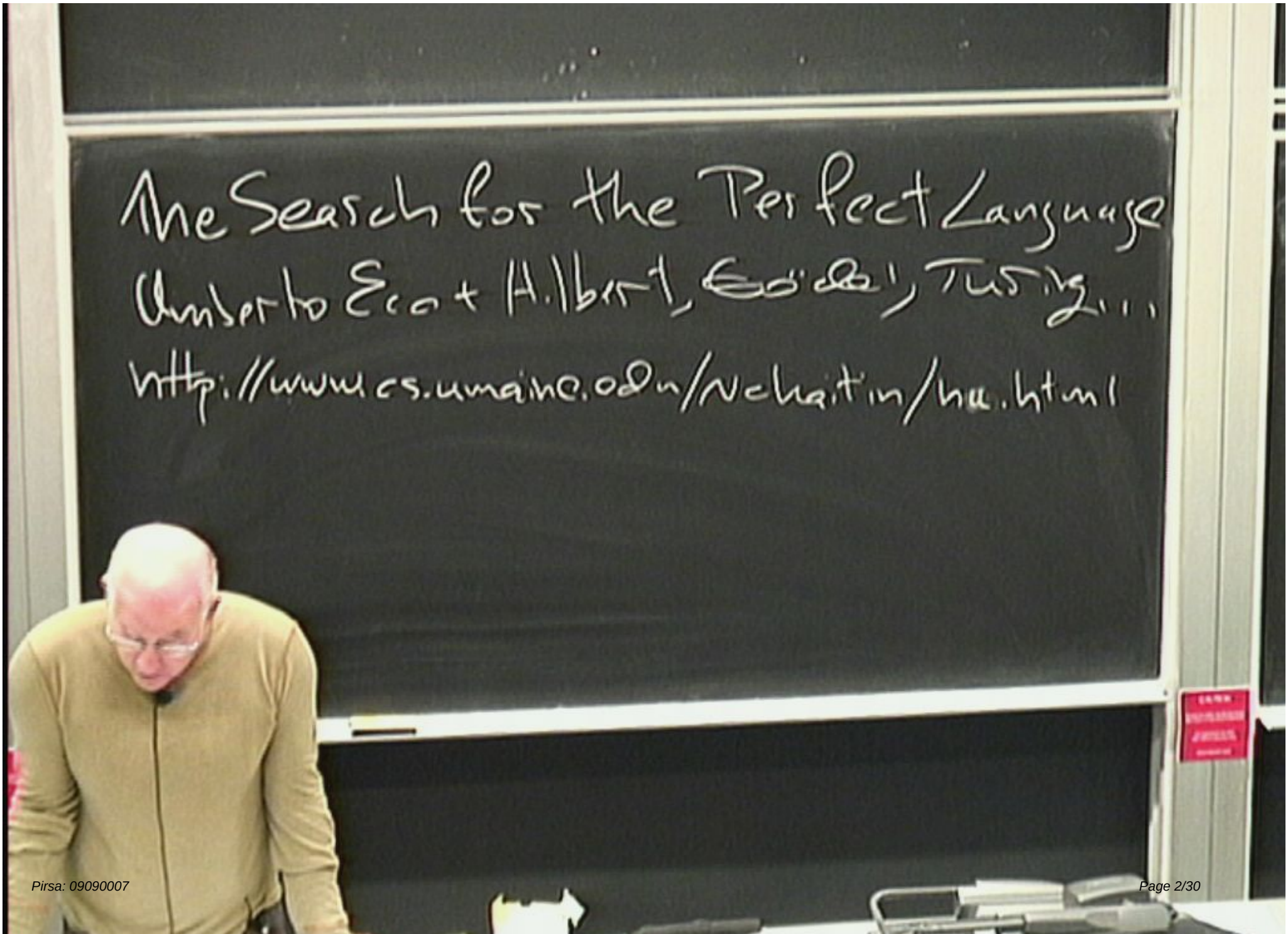
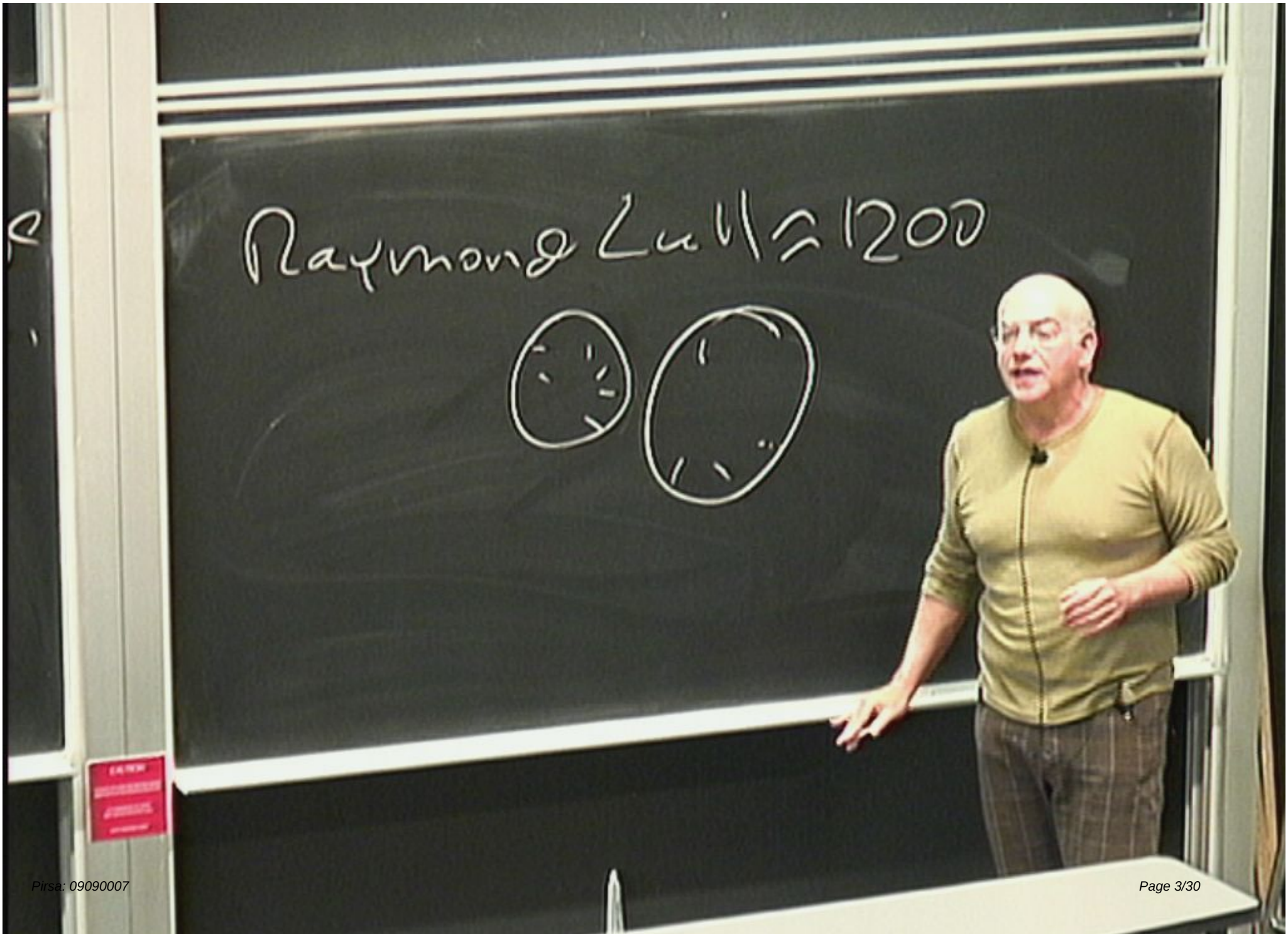
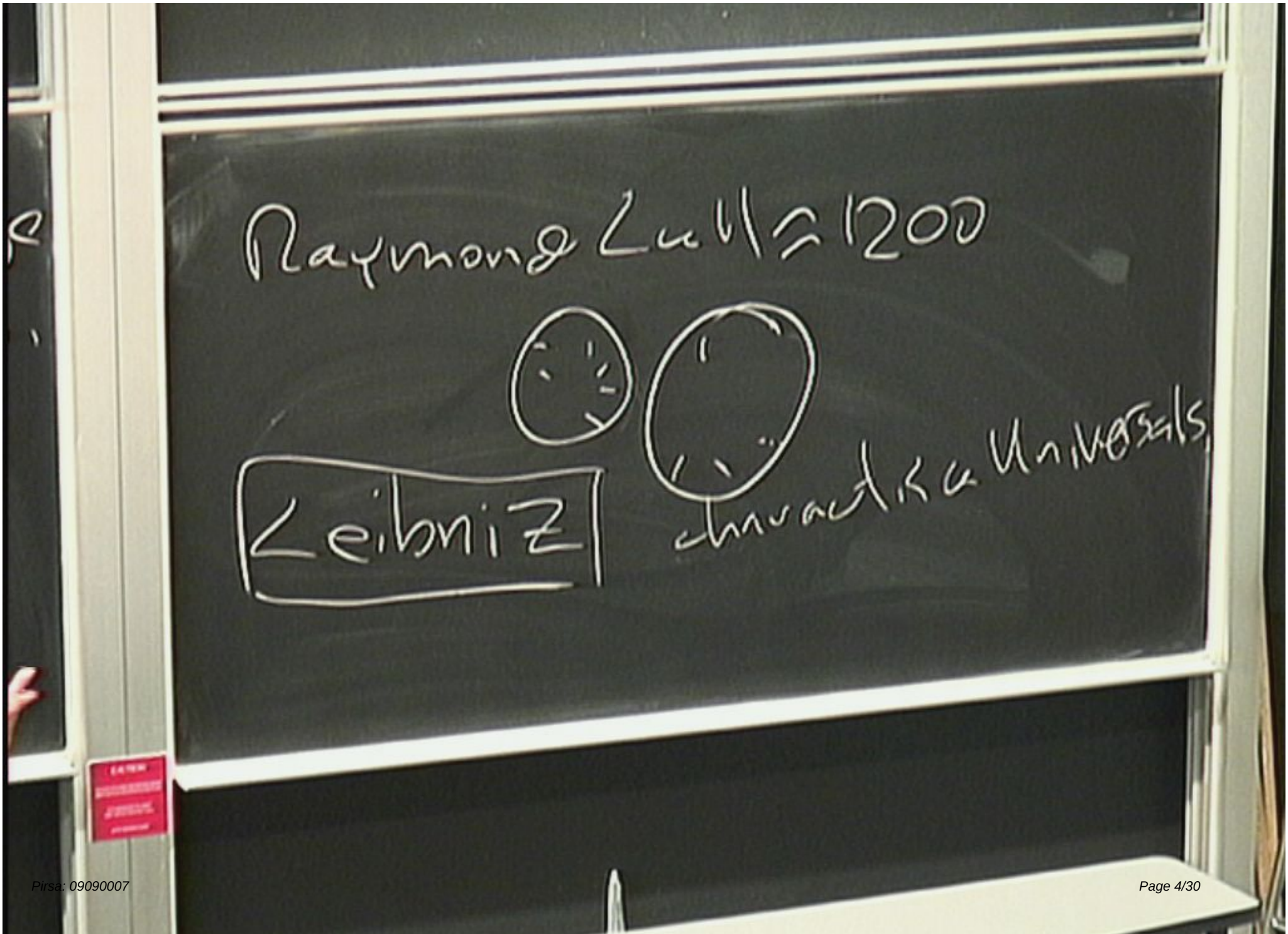
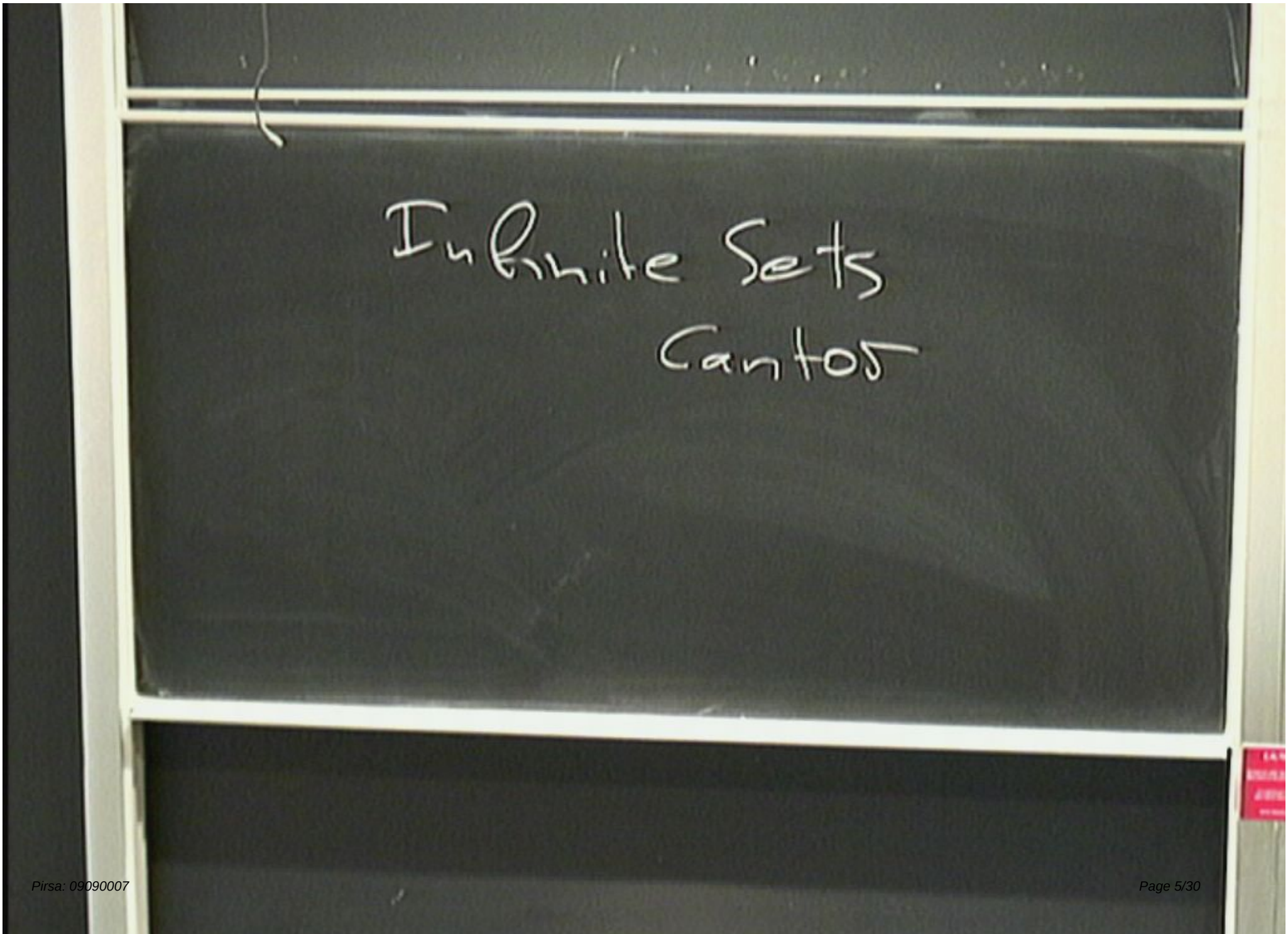
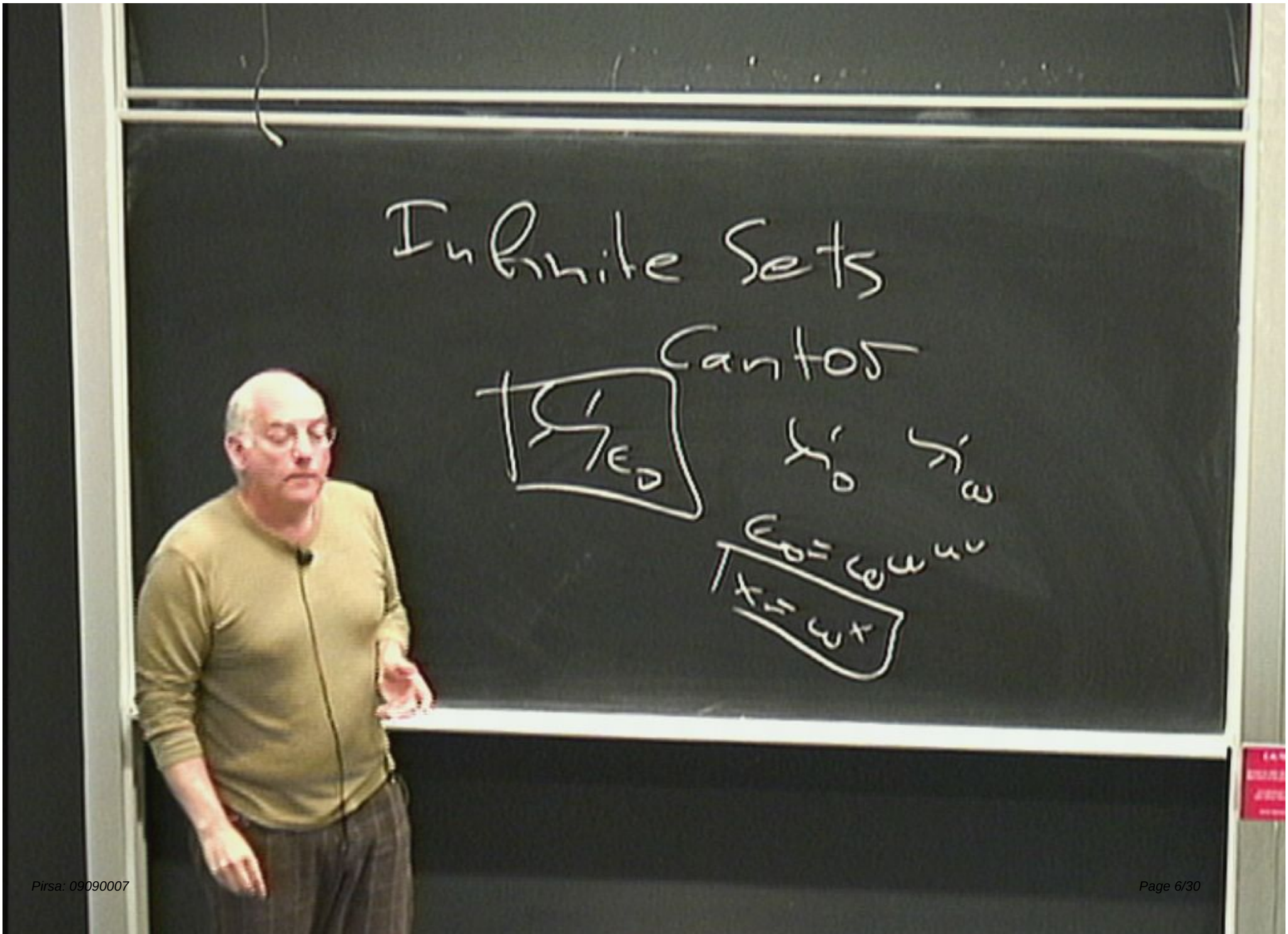
Abstract: I will tell how the story given in Umberto Eco's book The Search for the Perfect Language continues with modern work on logical and programming languages.(For more information, see http://www.umcs.maine.edu/~chaitin/hu.html.)


The Search for the Perfect Language
Umberto Eco + Albert, Godel, Turing...
http://www.cs.umaine.edu/~chaitin/hu.html


Raymond Lull ≈ 1200


Raymond Lull ≈ 1200
Leibniz
characteristica Universalis


Infinite Sets
Cantor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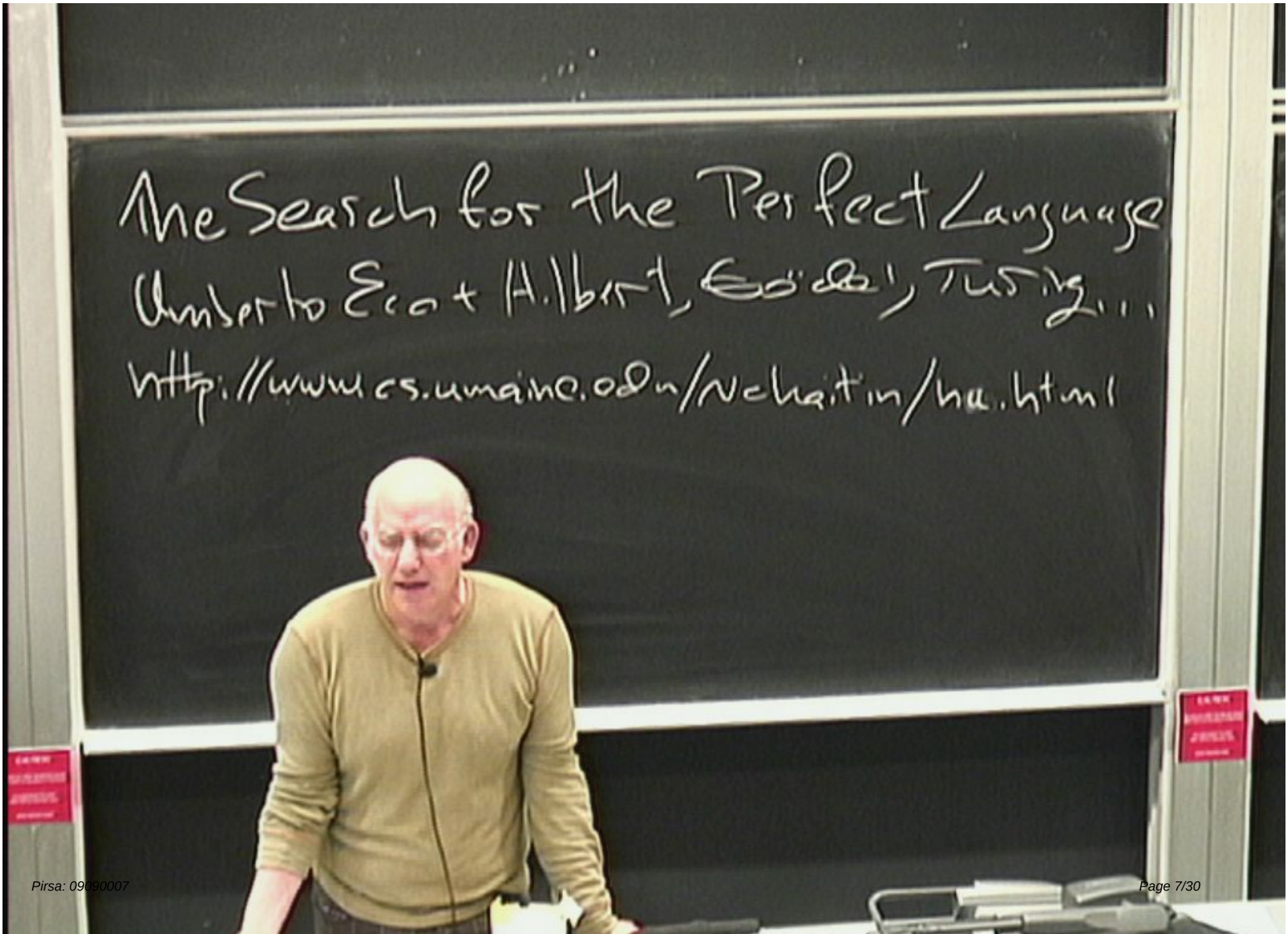
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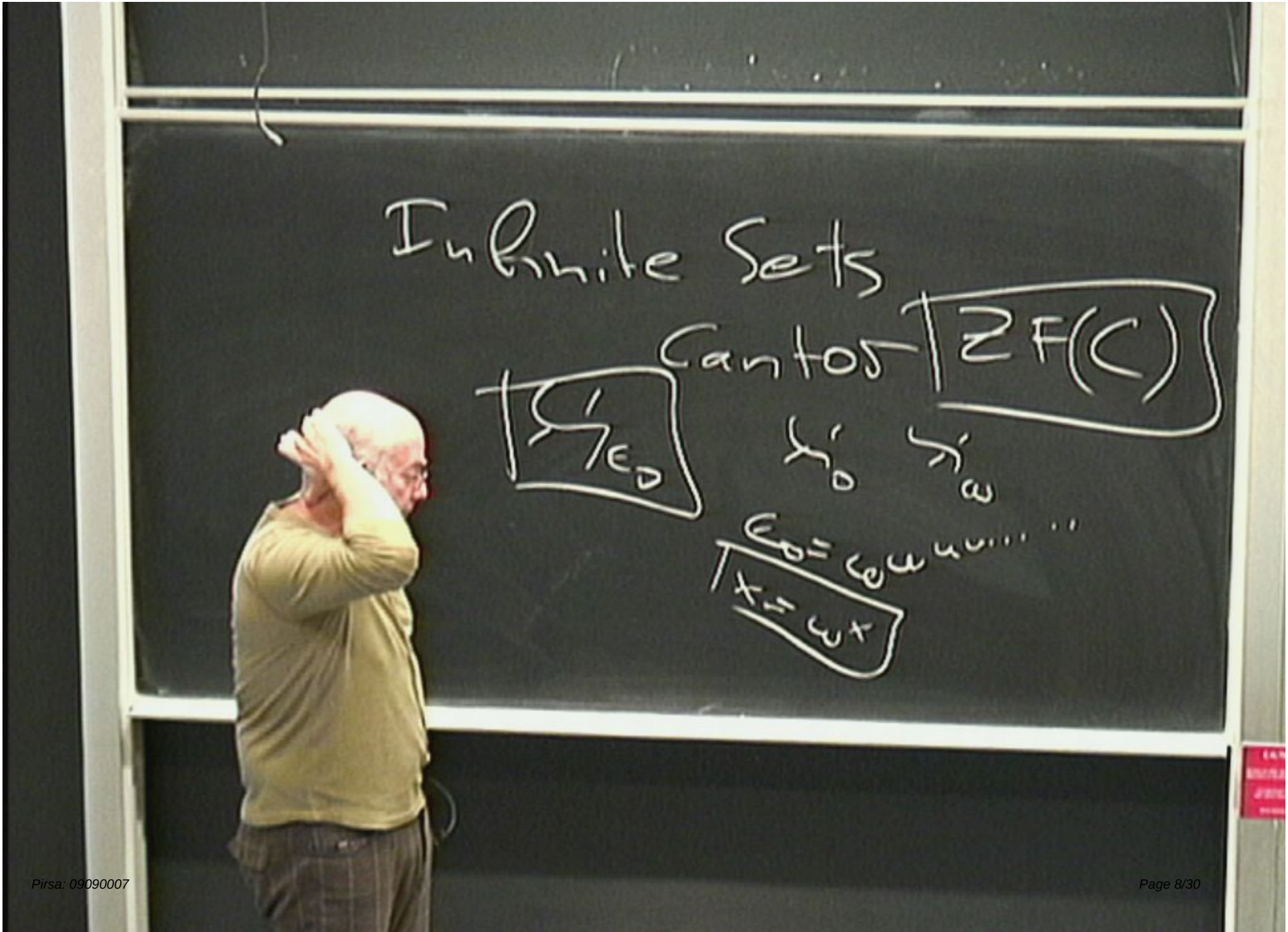
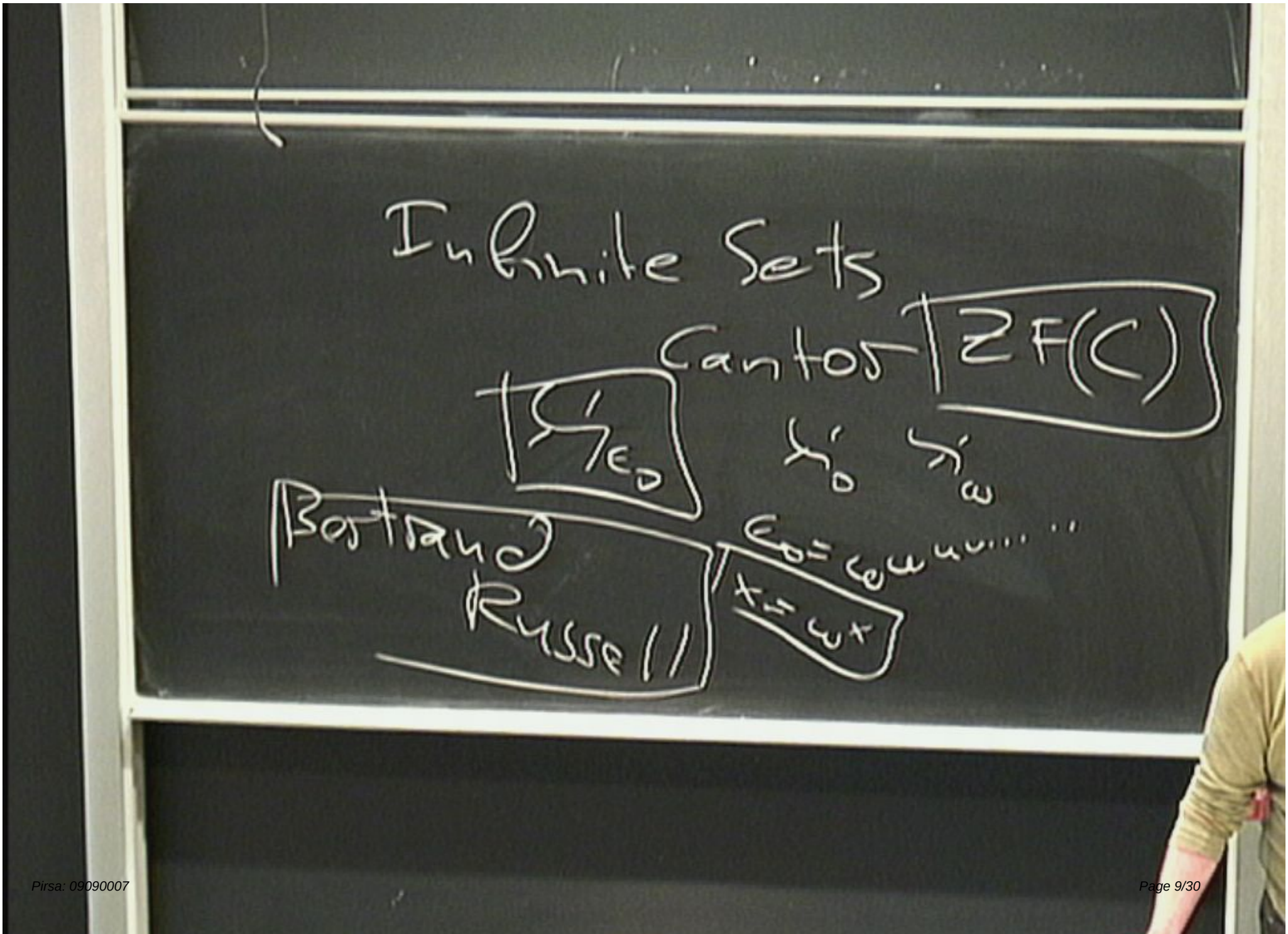

Infinite Sets
Cantor
ZF(C)
$\aleph_0$ $\aleph_\omega$
$\epsilon_0 = \omega^{\omega^{\omega^{\cdots}}}$
$x = \omega^x$


Infinite Sets
Cantor
ZF(C)
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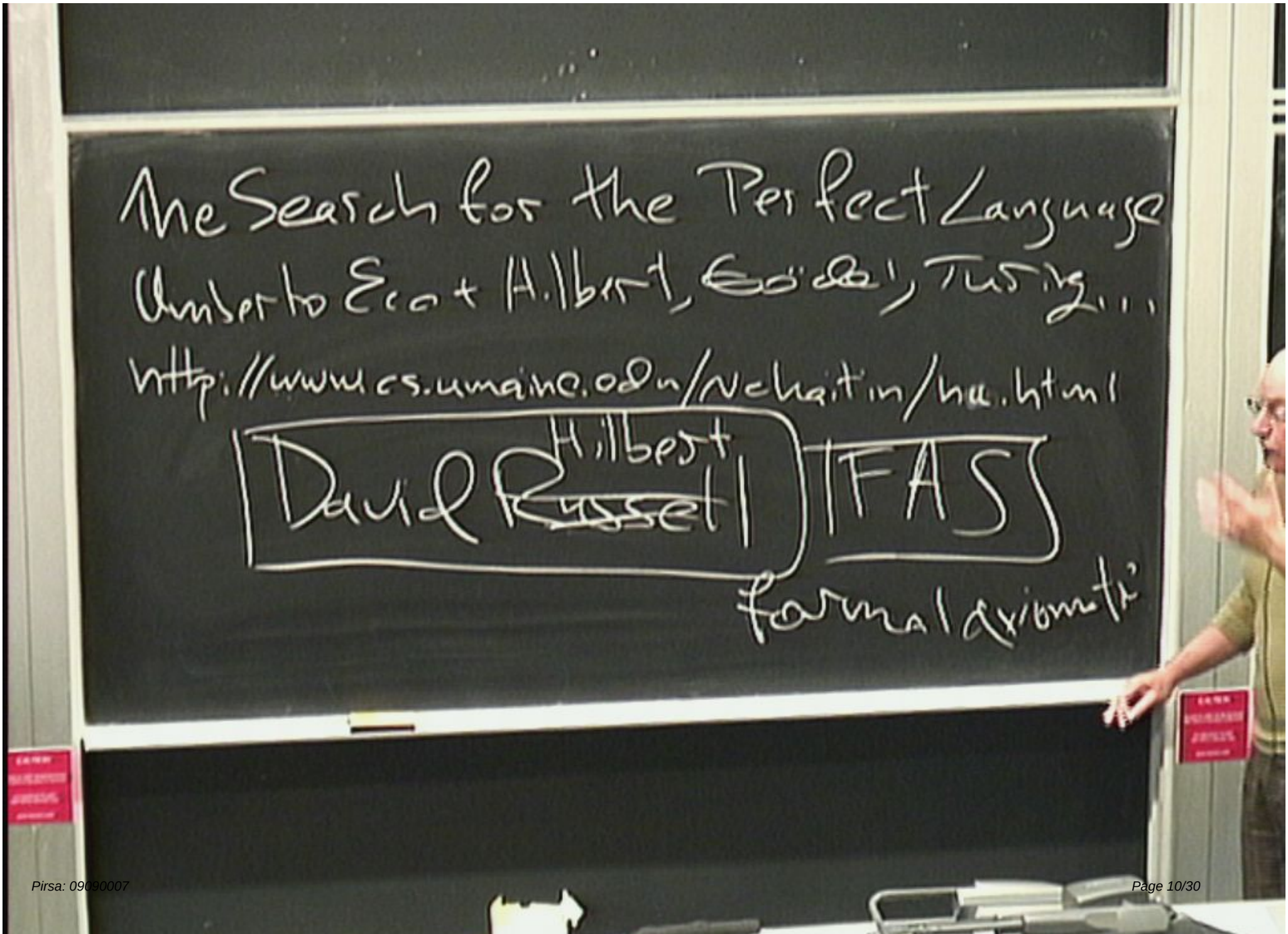
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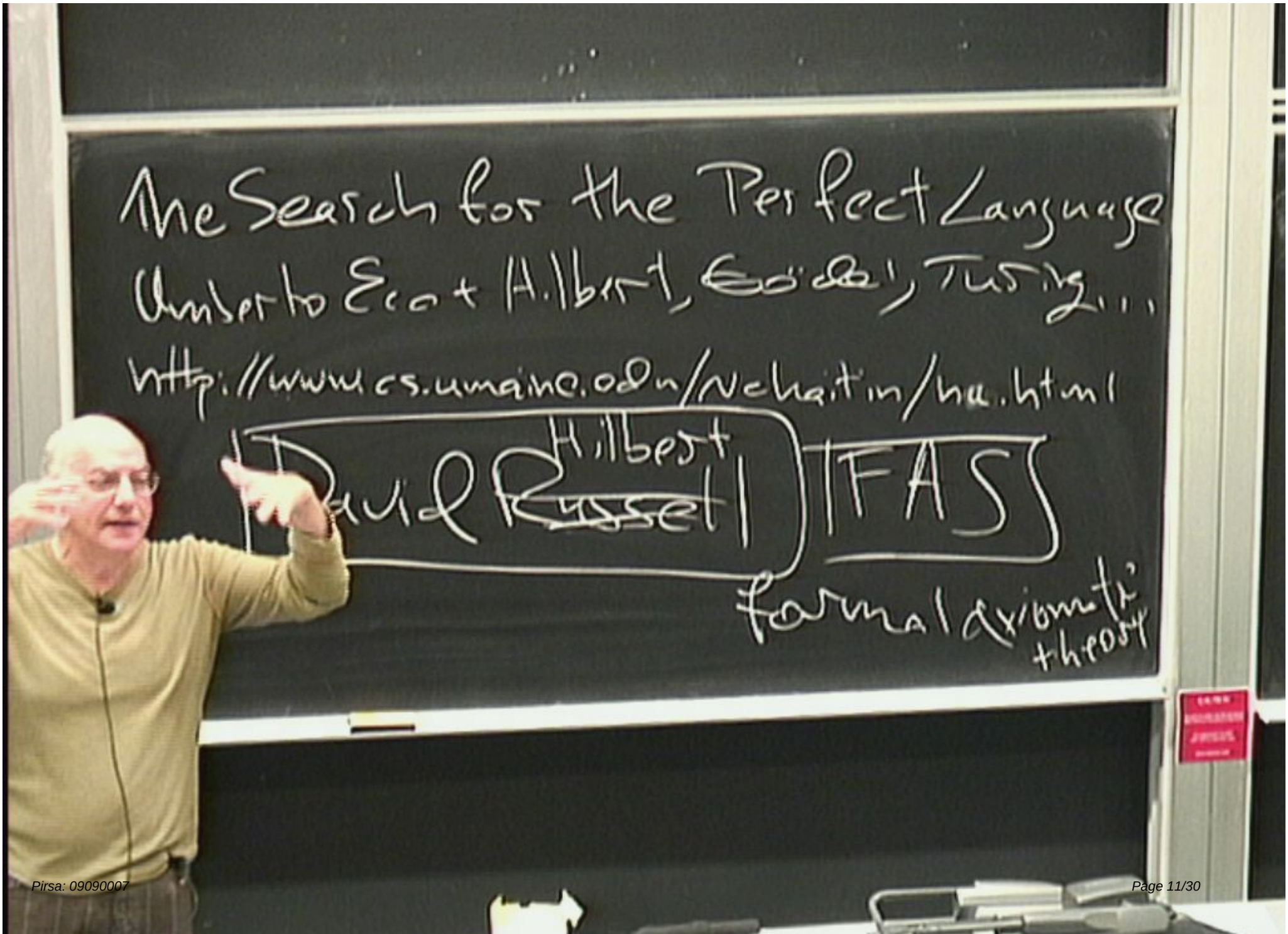
David Hilbert
Russell
IFAS
formal axiomatic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Hilbert
Paul Russell
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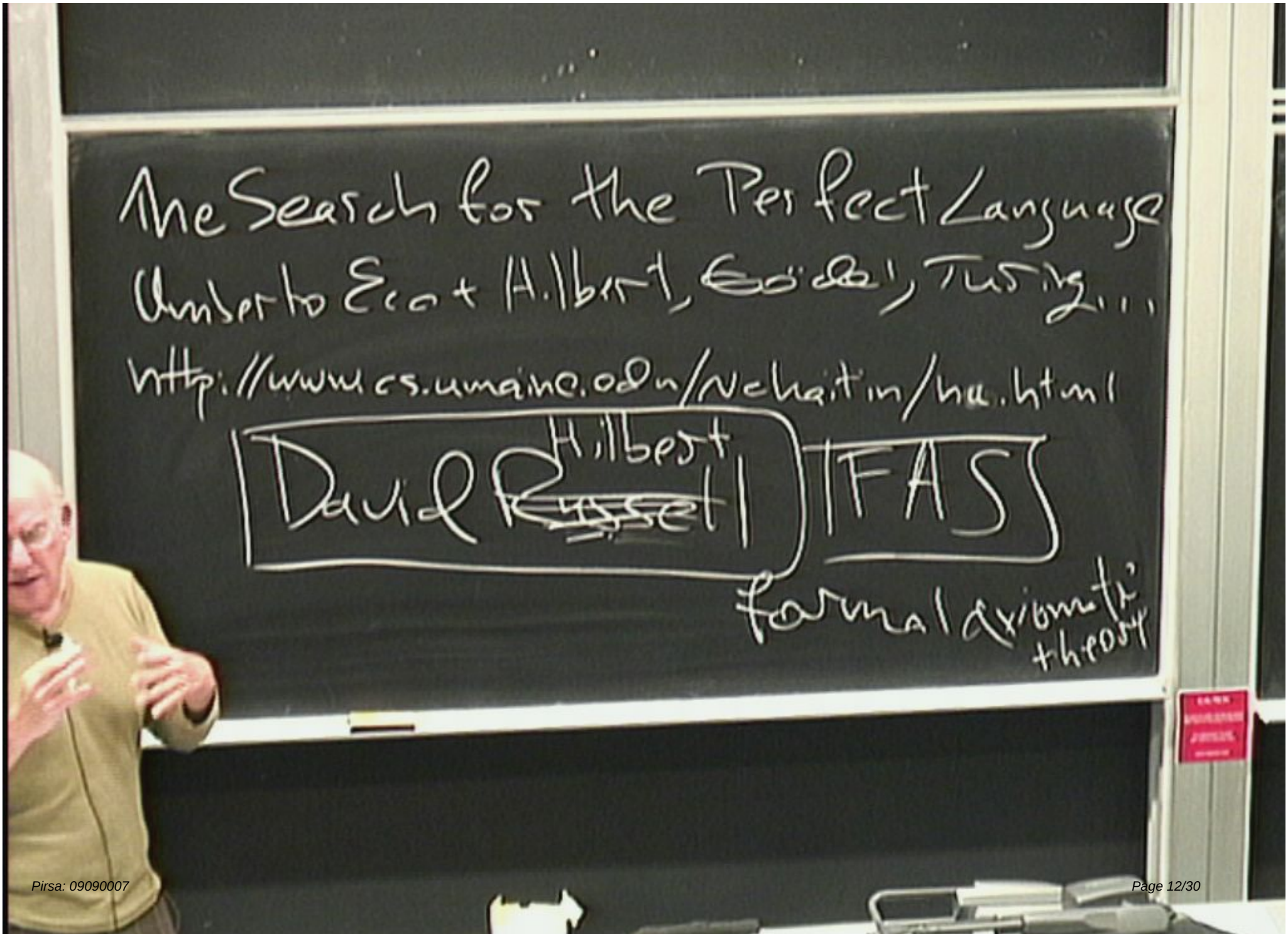
formal axiomatic theory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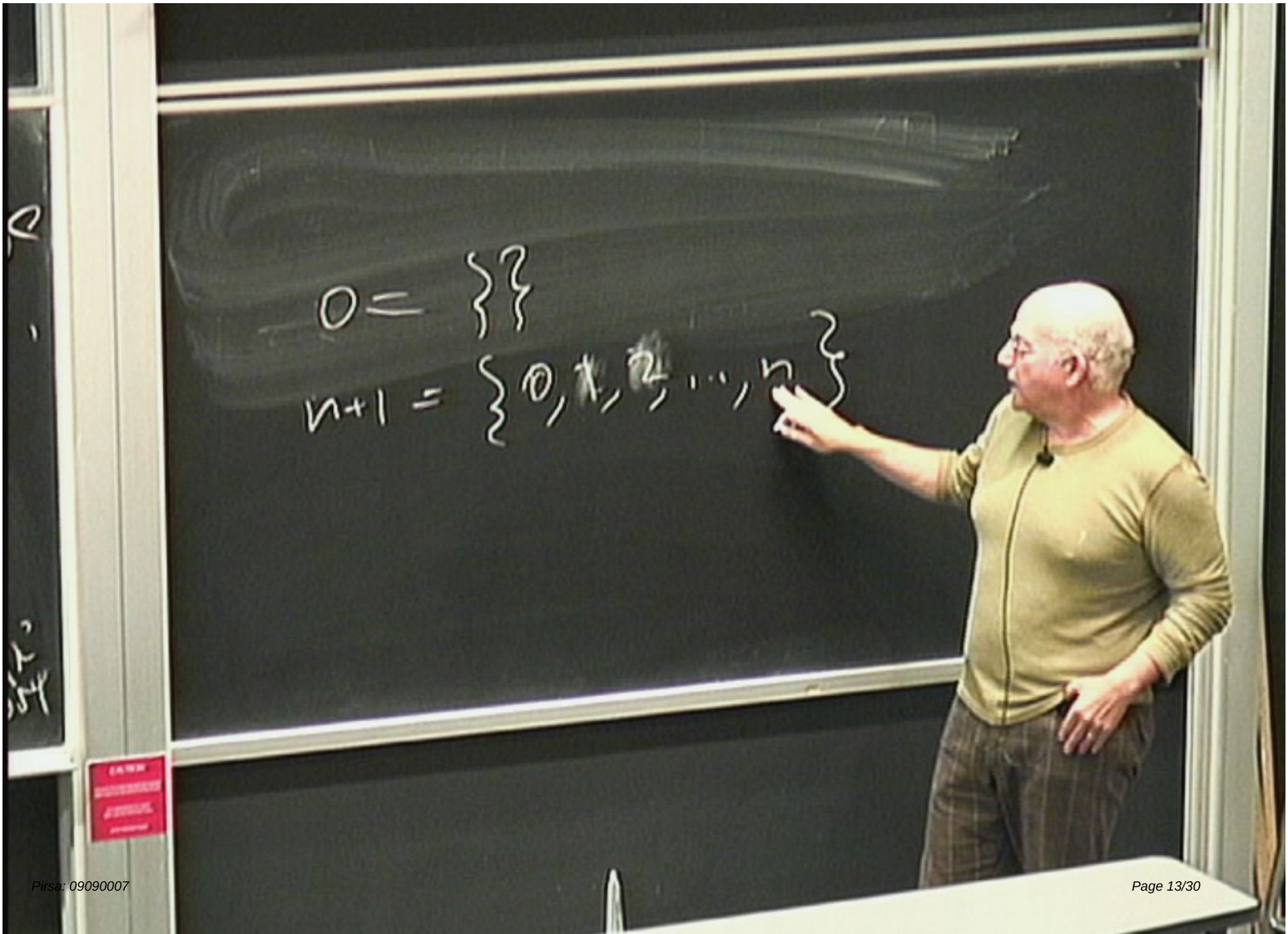
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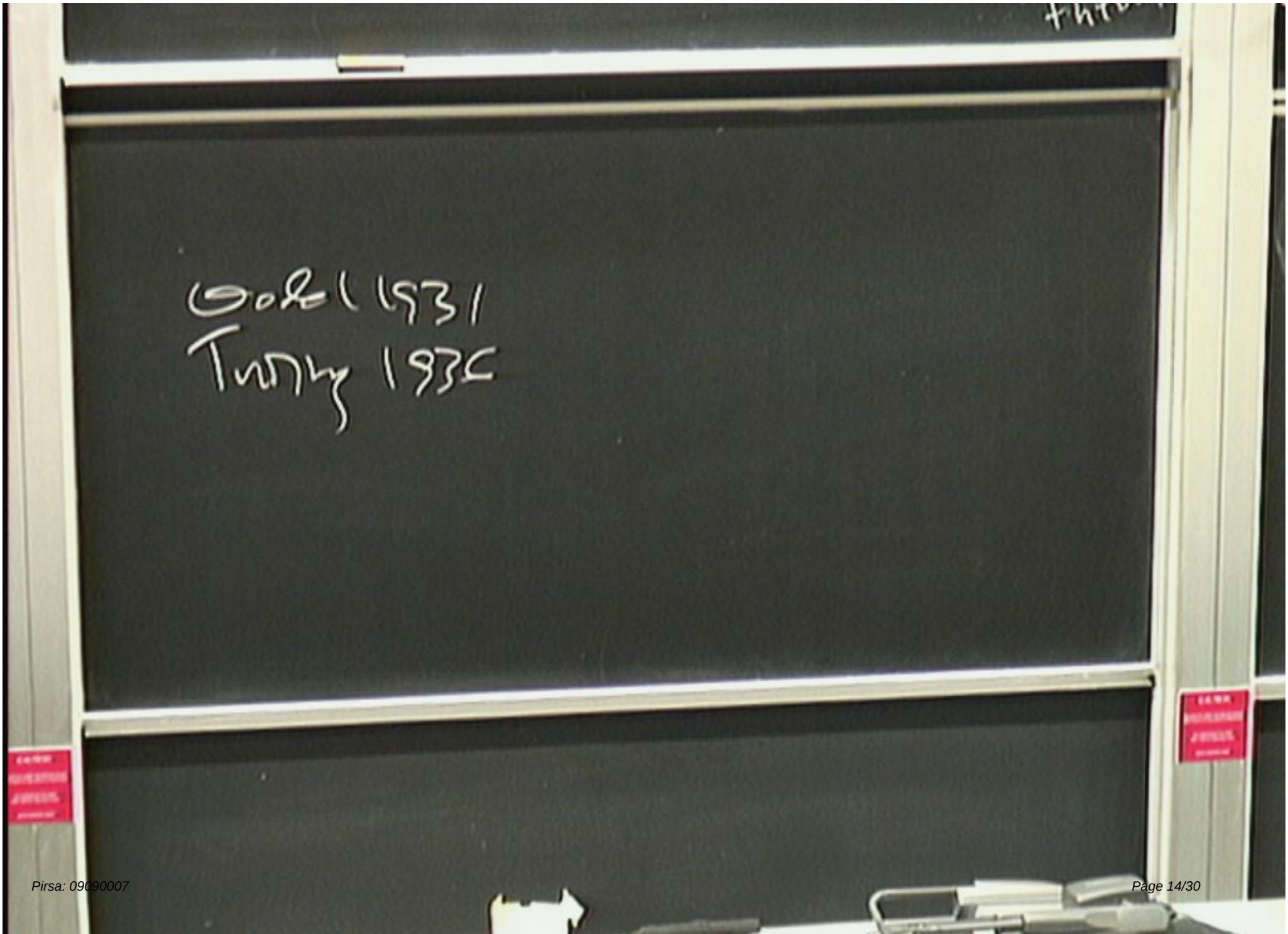
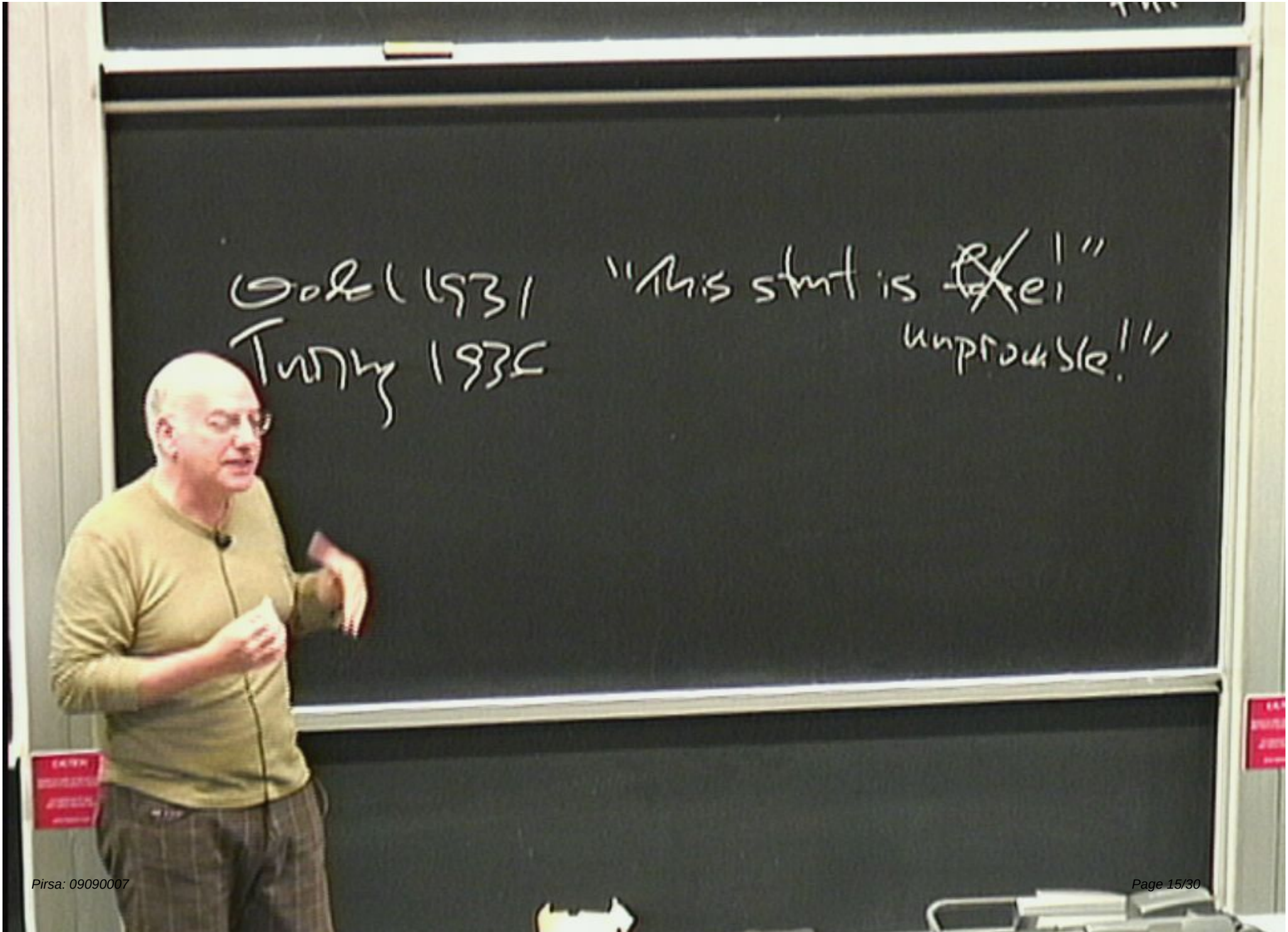
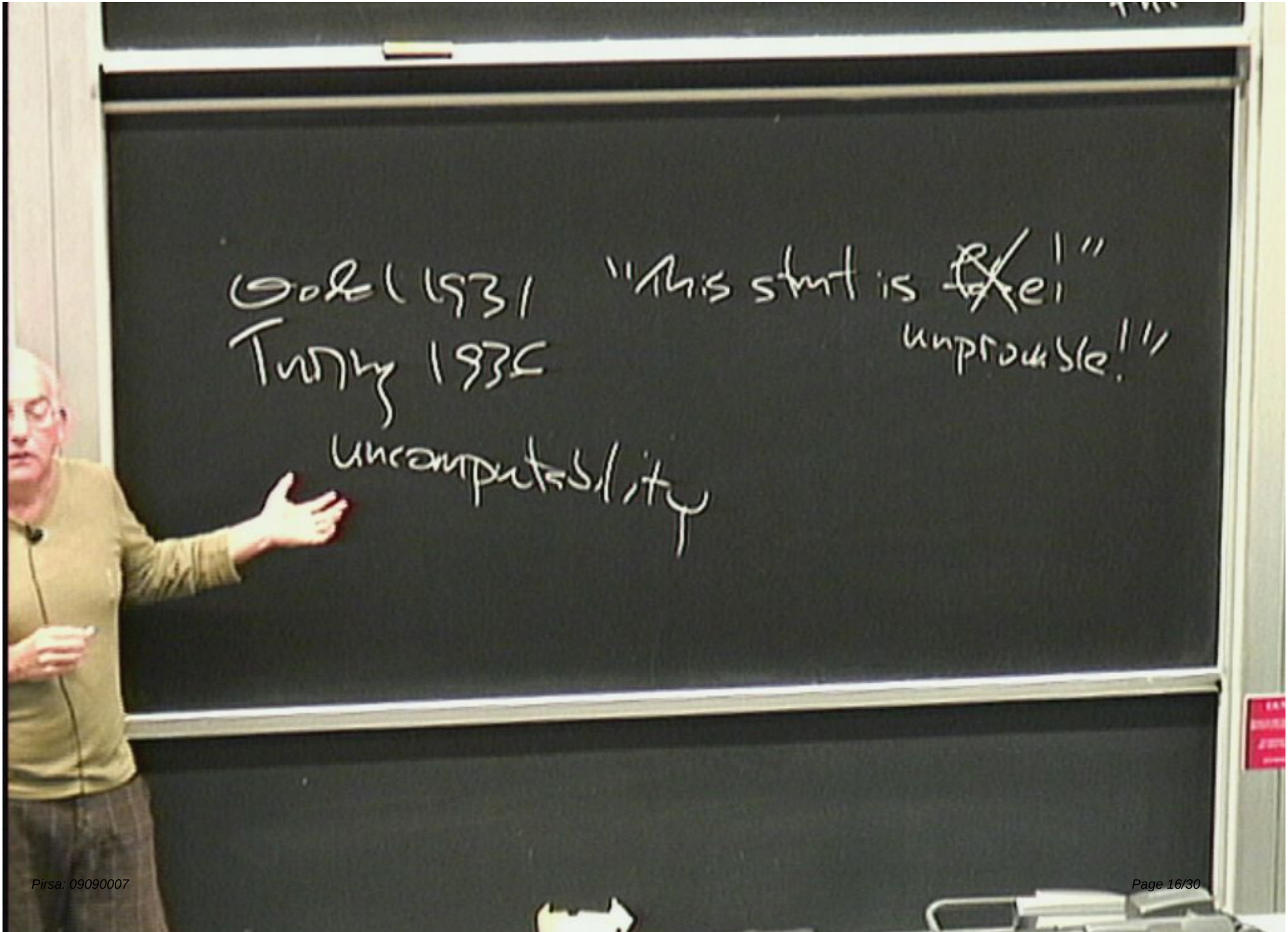
n+1 = {0, 1, 2, ..., n}


Bohr 1931
Tunby 1935


Godel 1931
Turing 1936
"This stmt is ~~Exe~~!"
unprovable!"


Gödel 1931
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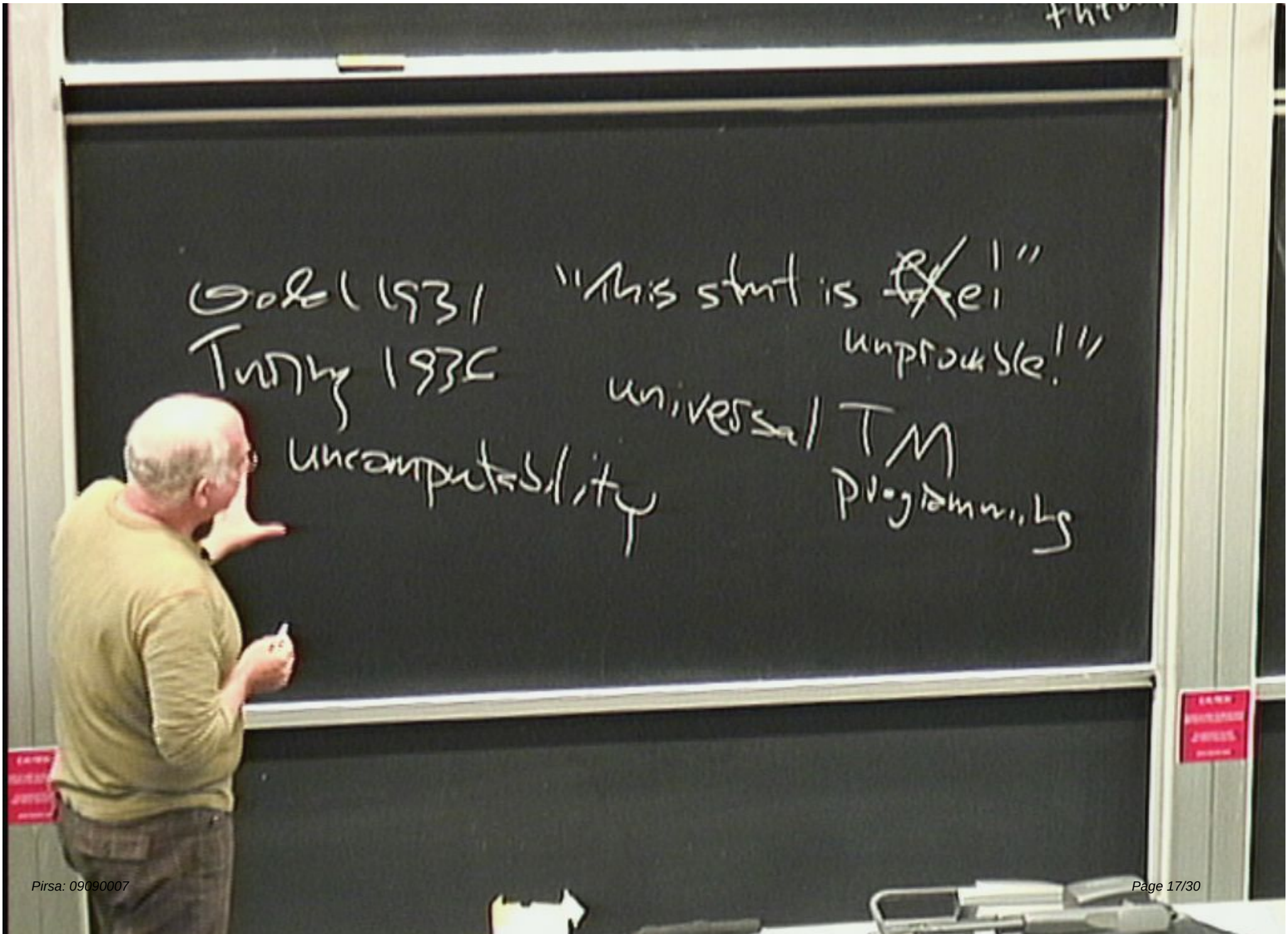
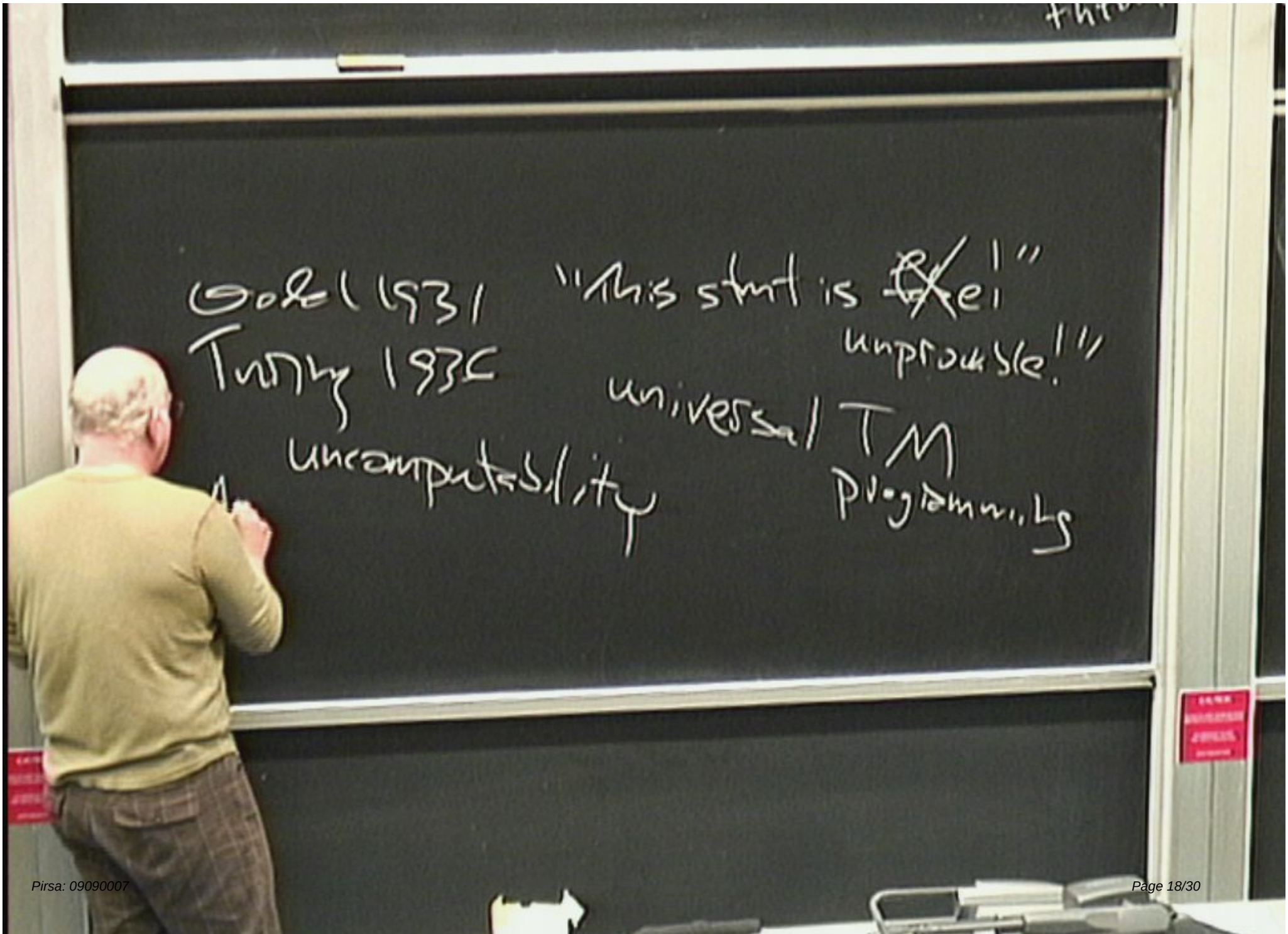
uncomputability
"This stmt is unprovable!"


Gödel 1931
Turing 1936
uncomputability
"This stmt is unprovable!"
universal TM
programs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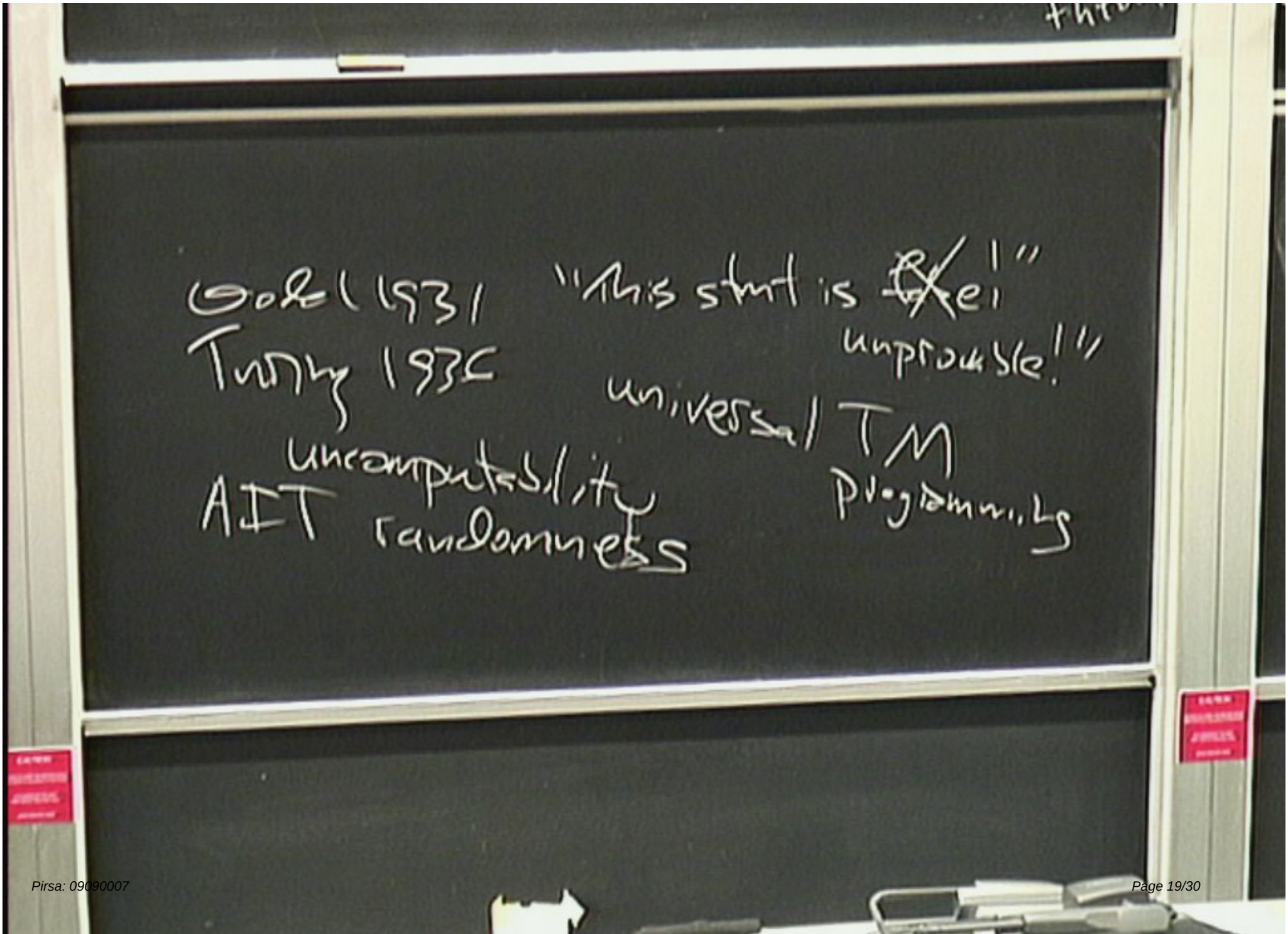
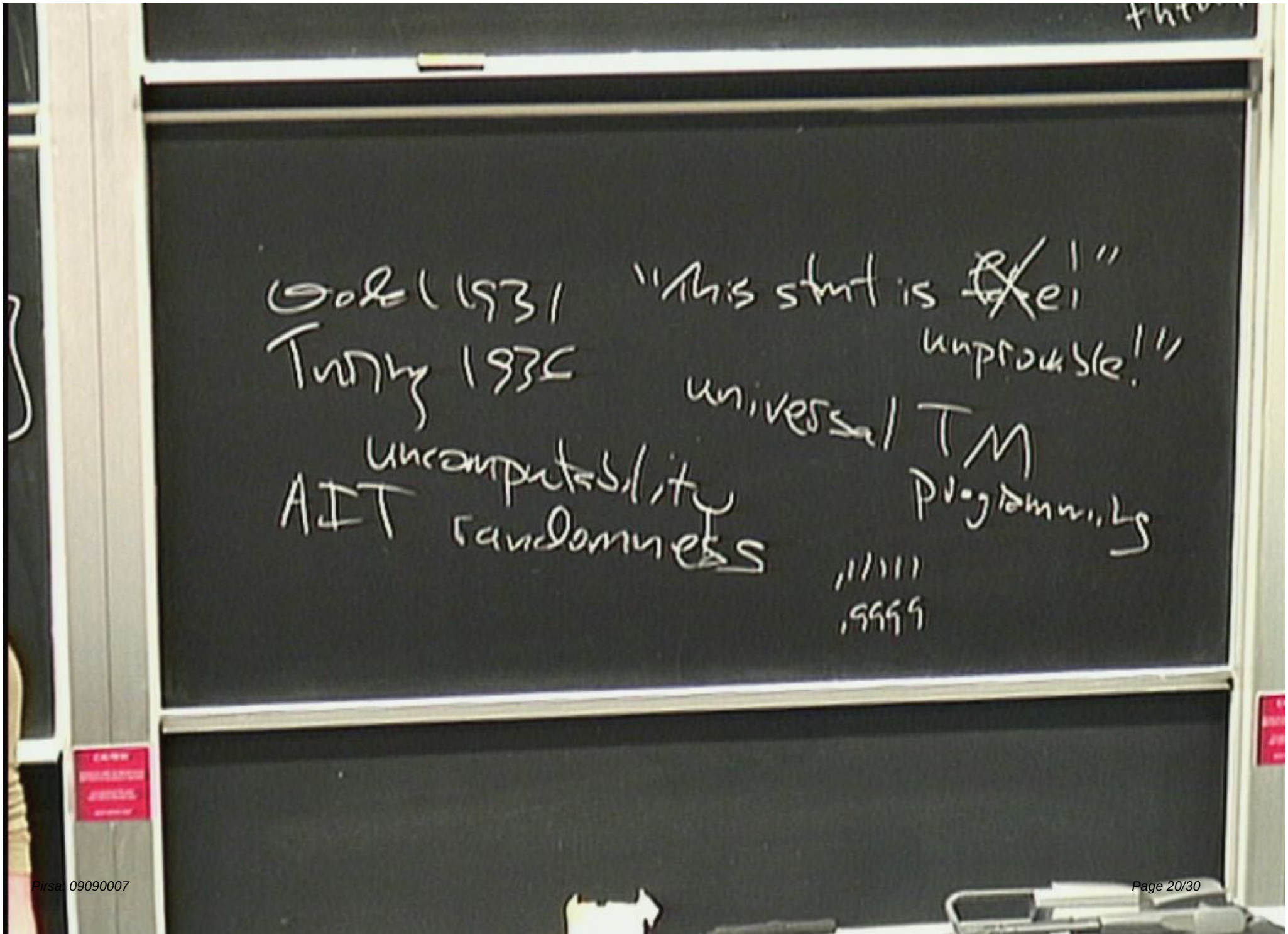

Gödel 1931
"This stmt is unprovable!"
Turing 1936
universal TM
uncomputability
AIT
randomness
programs


Godel 1931
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uncomputability
AIT randomness
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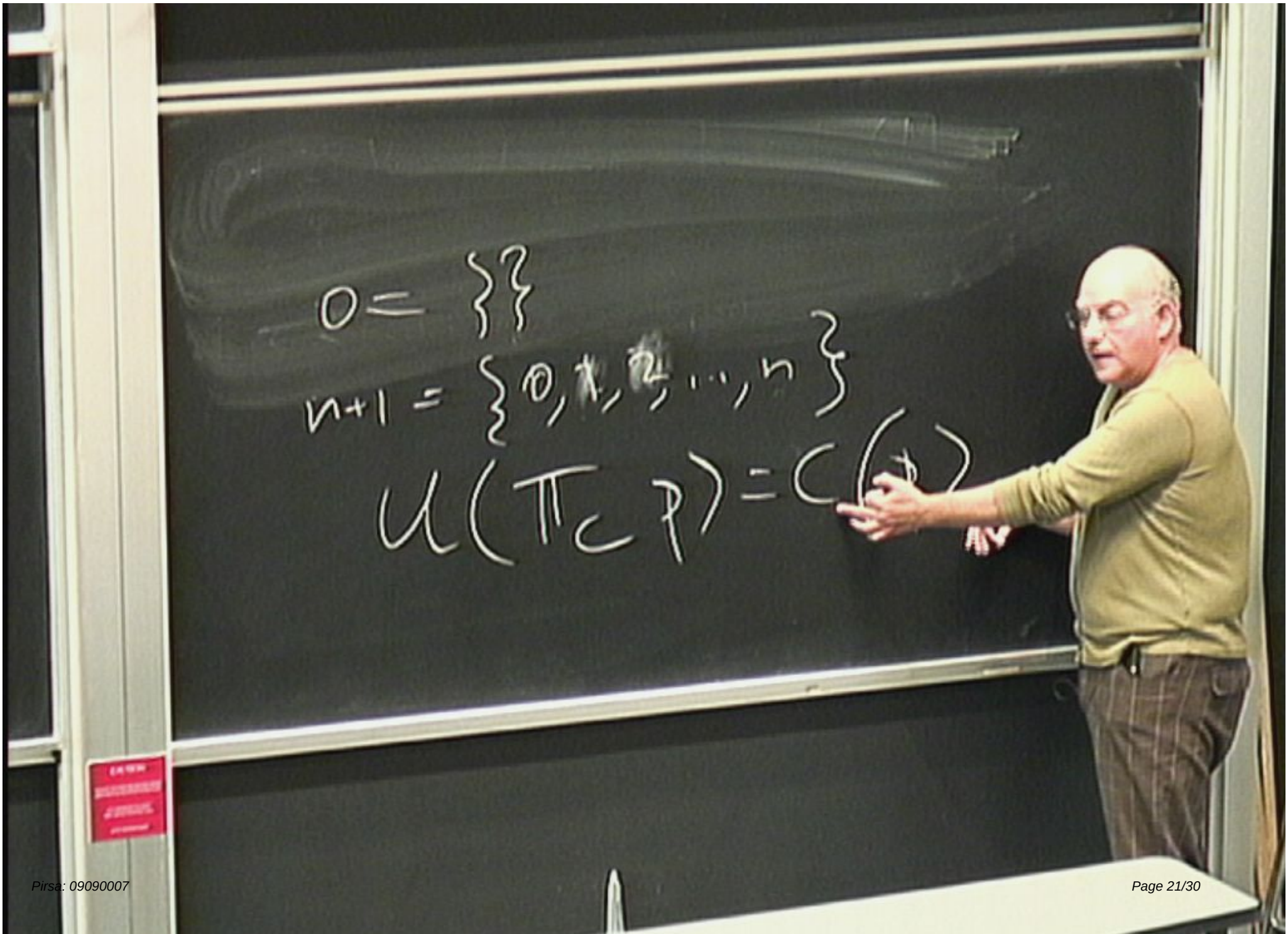
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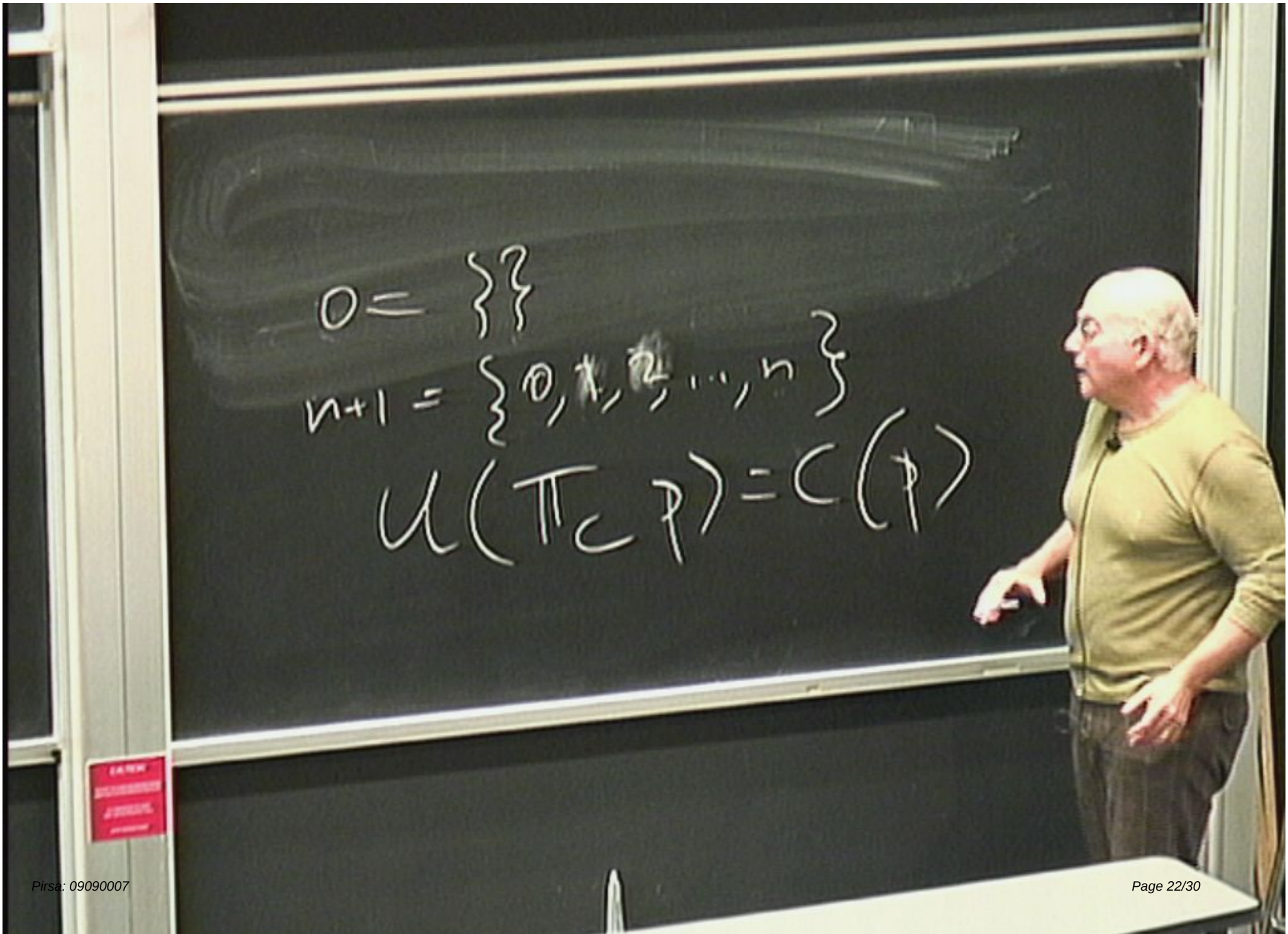
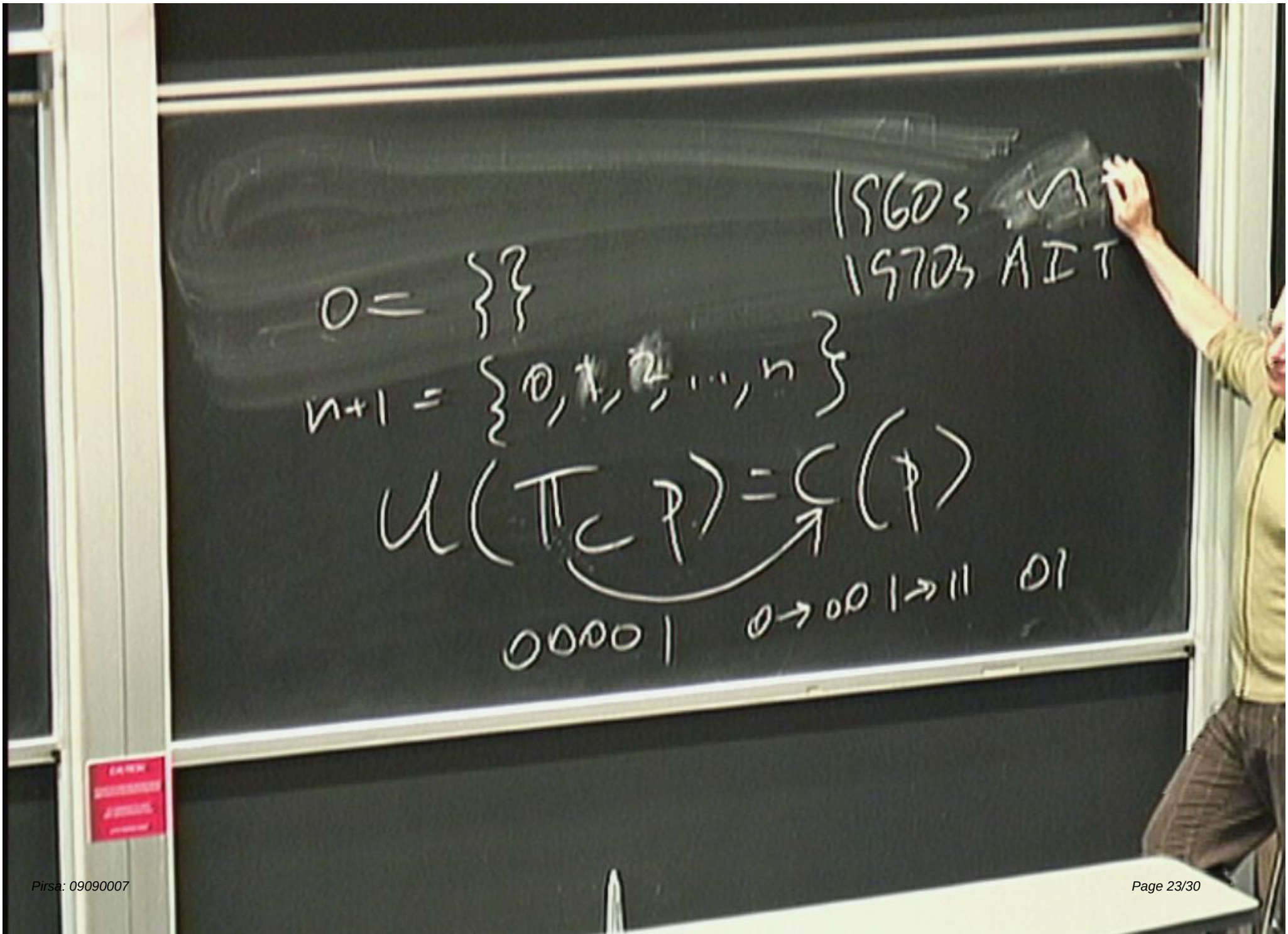
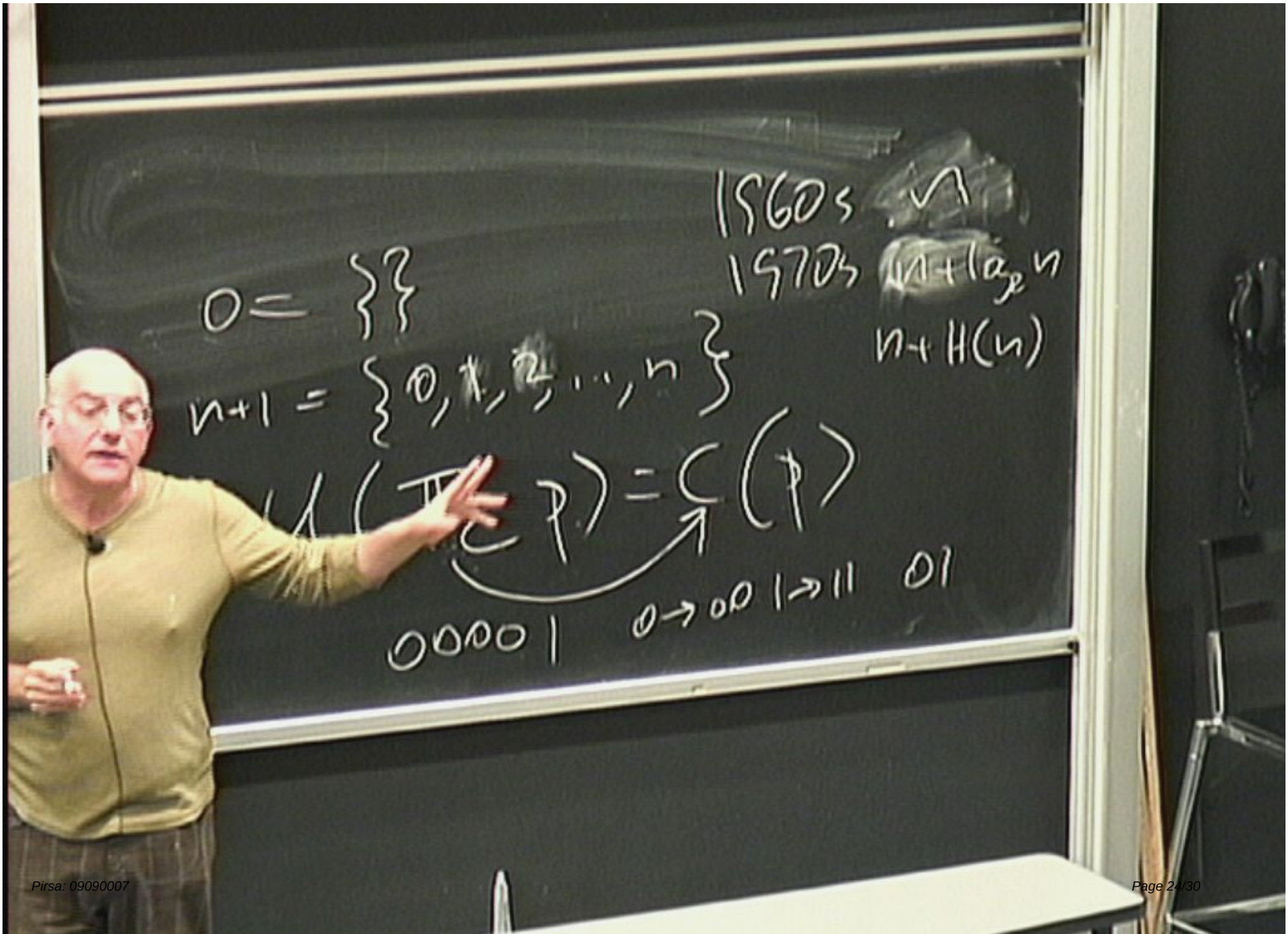
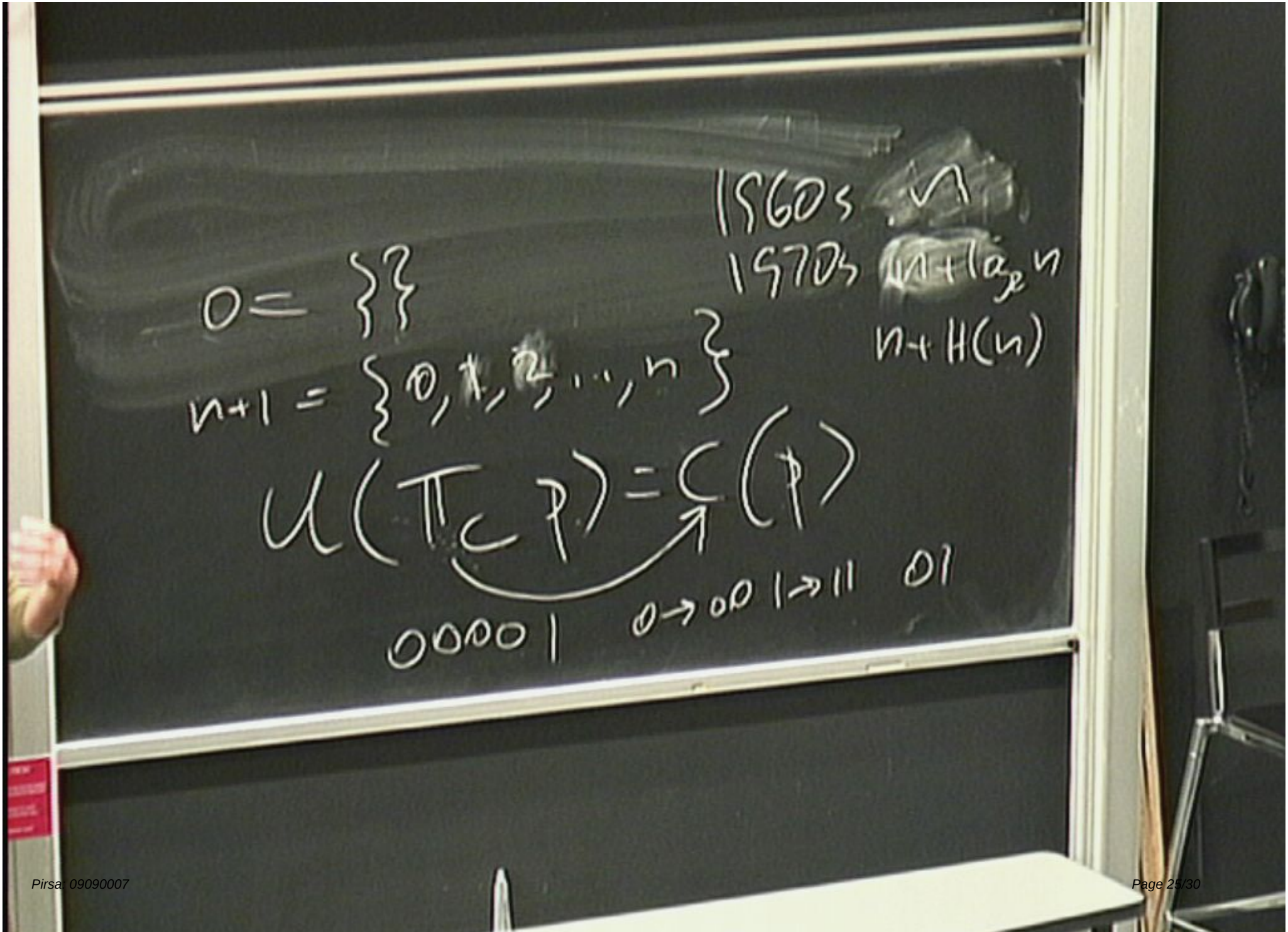
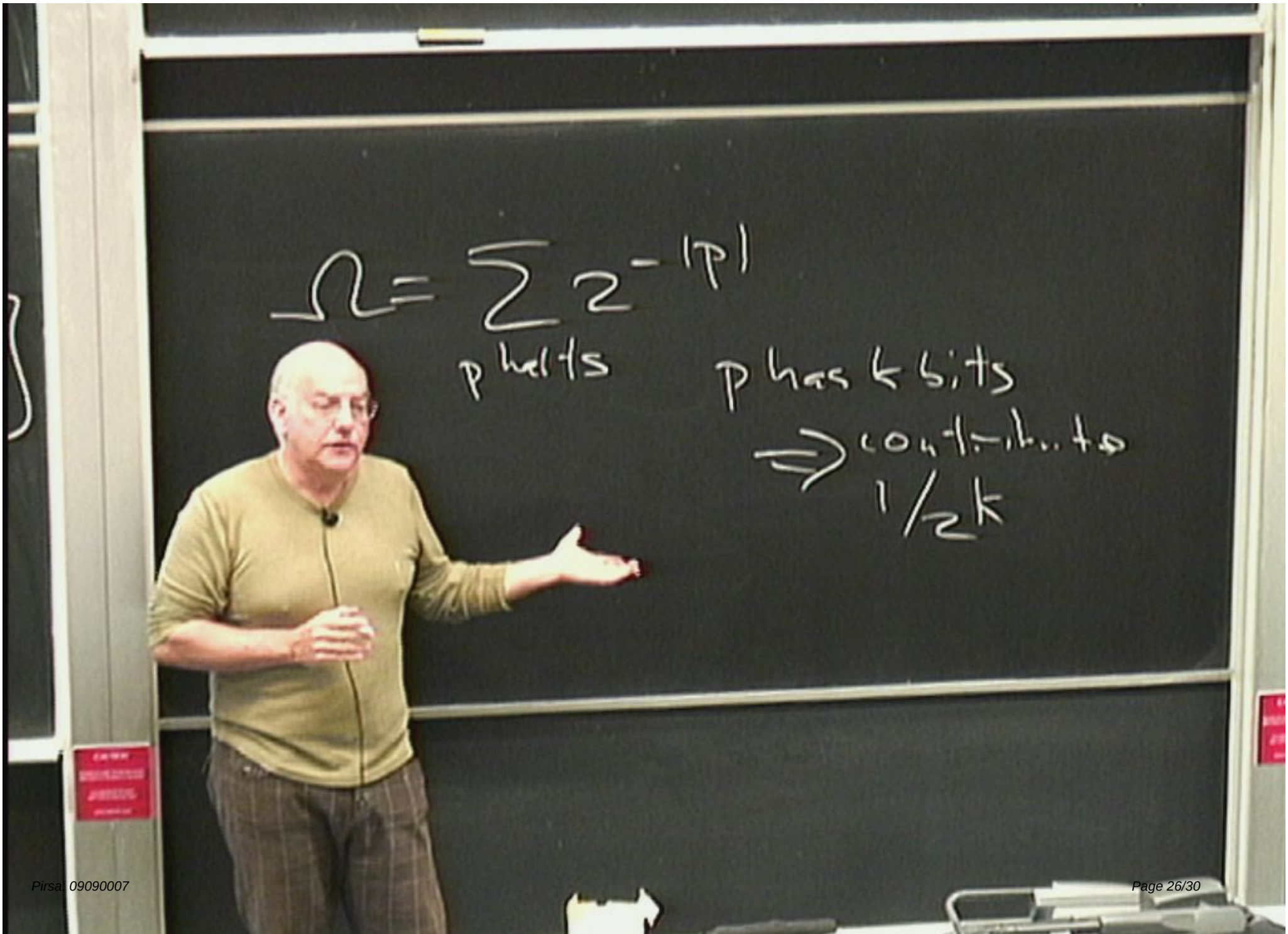
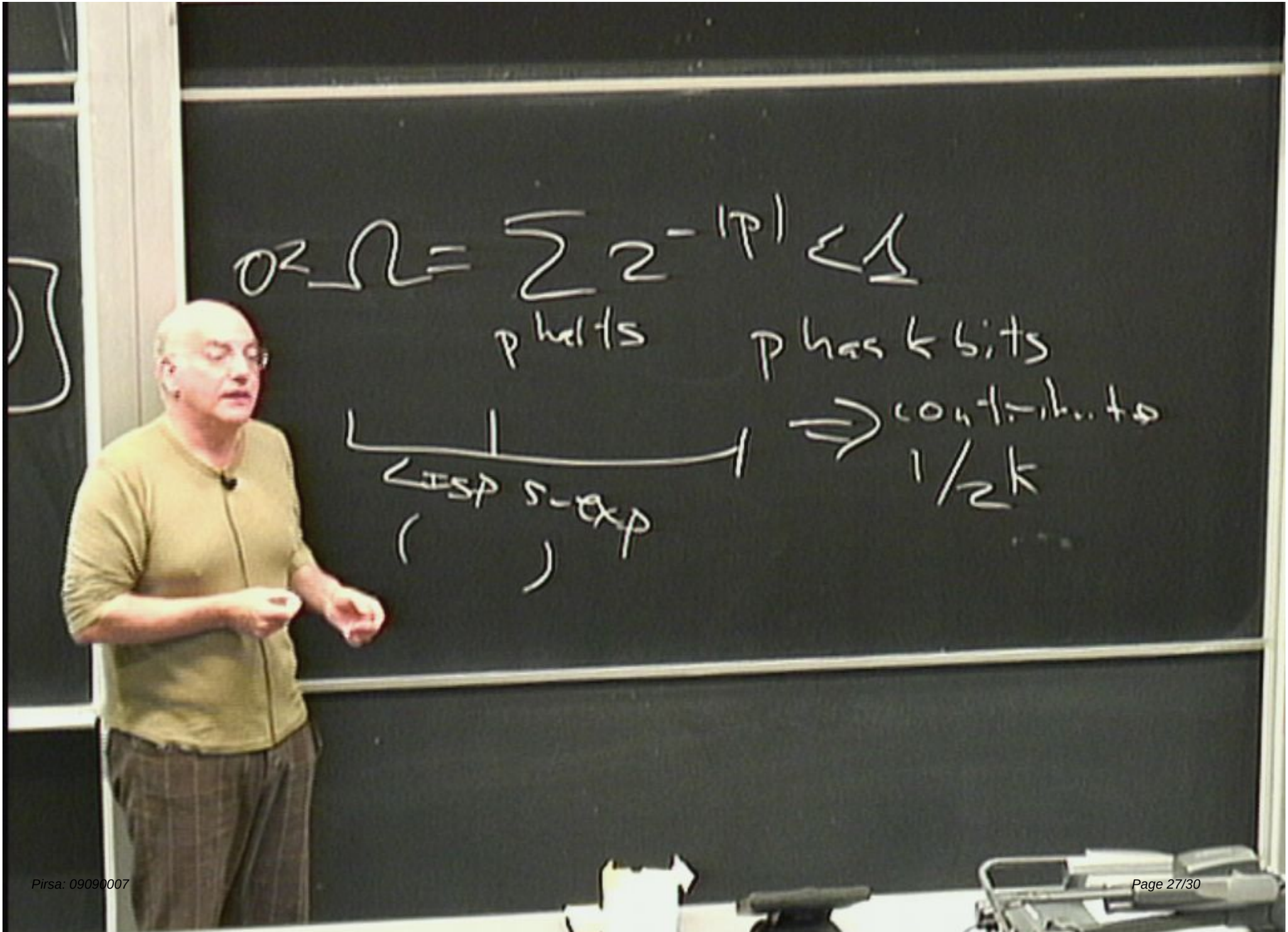

0 = {}
n+1 = {0, 1, 2, ..., n}
U(π ⊂ P) = C(P)

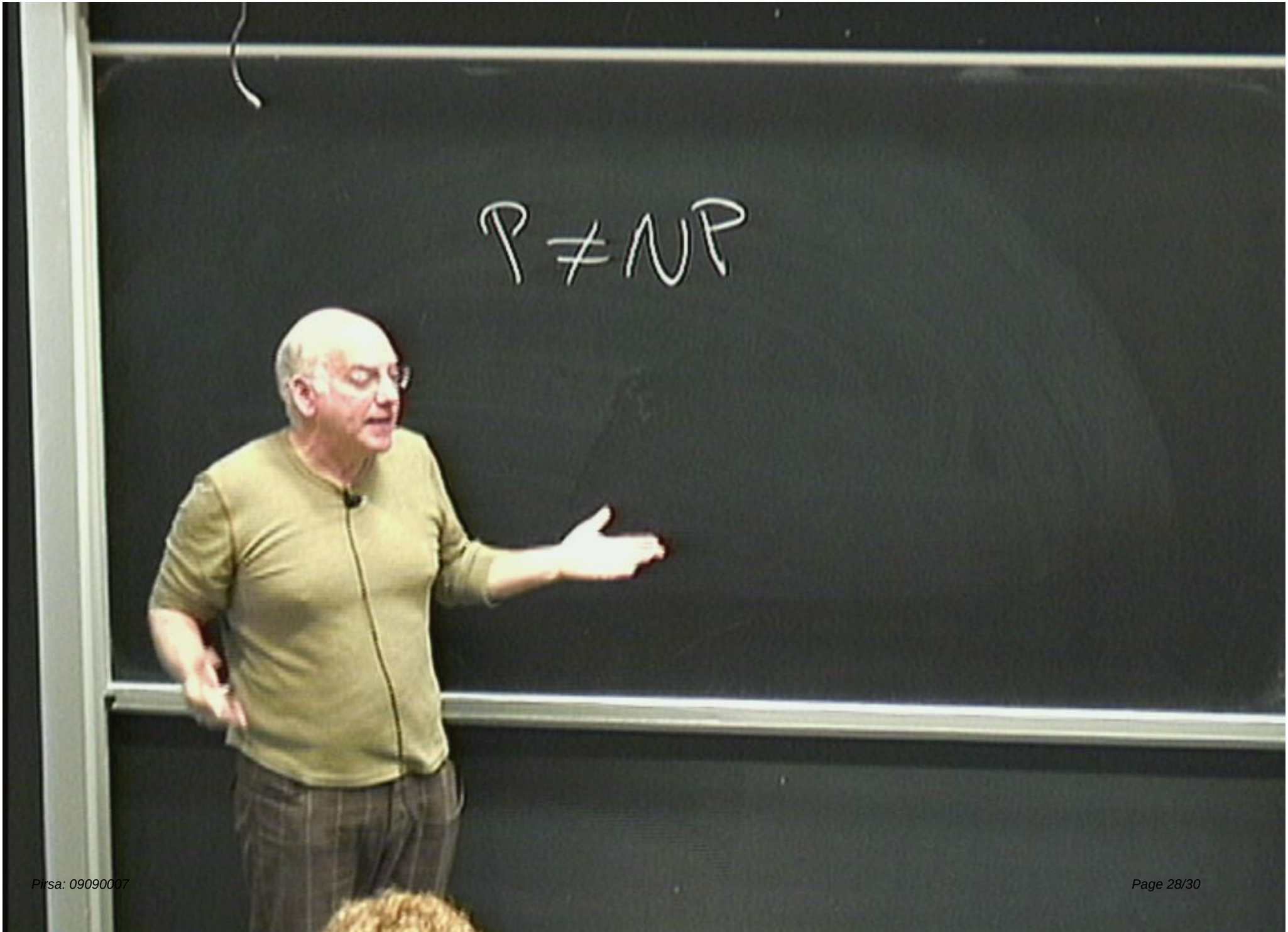

1960s
1970s AIT
0 = {}
n+1 = {0, 1, 2, ..., n}
U(T, P) = C(P)
00001
0 → 00 1 → 11 01

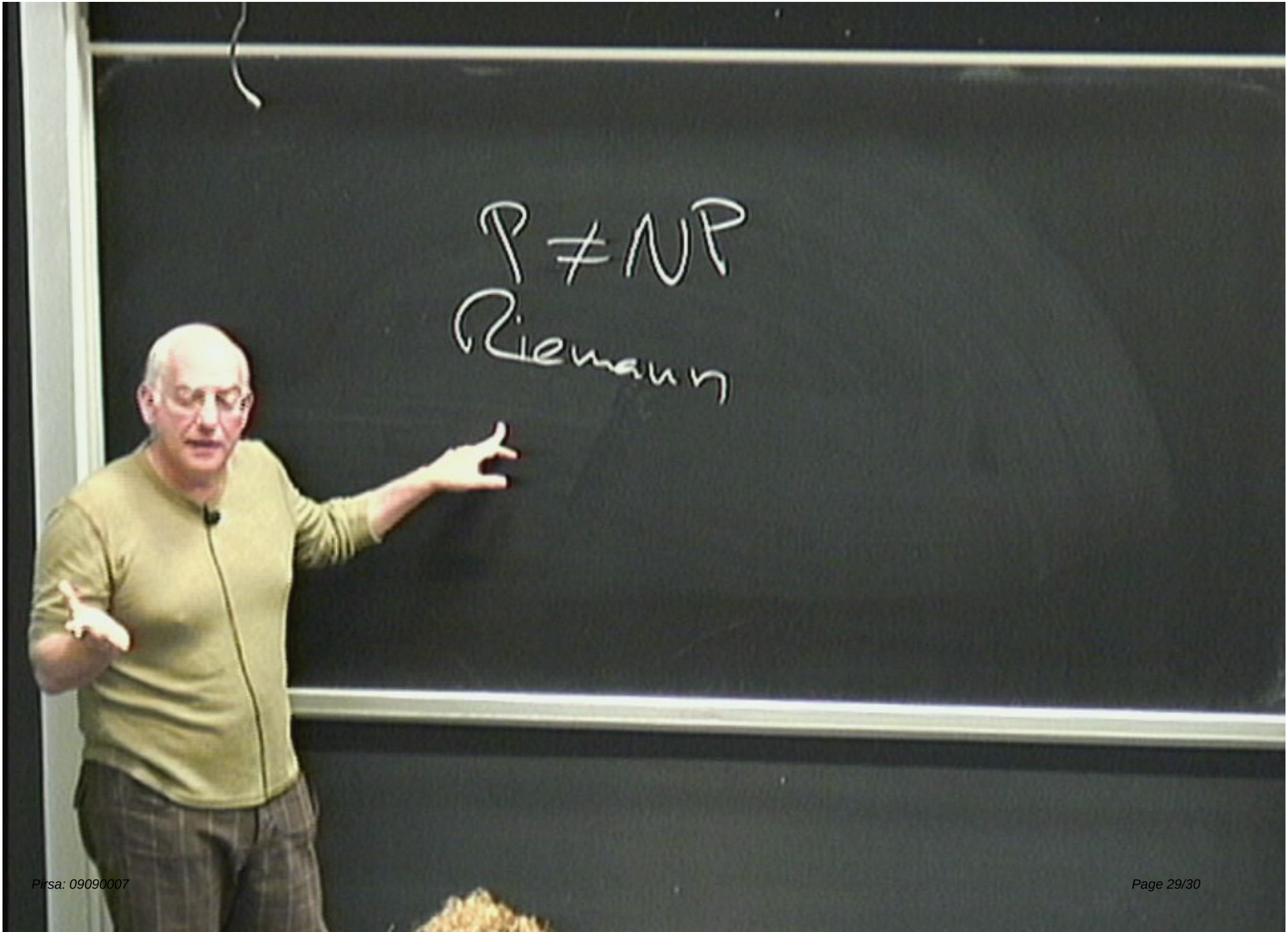

1960s
1970s
n+1 = {0, 1, 2, ..., n}
n+H(n)
0000 1
0→00 1→11 01

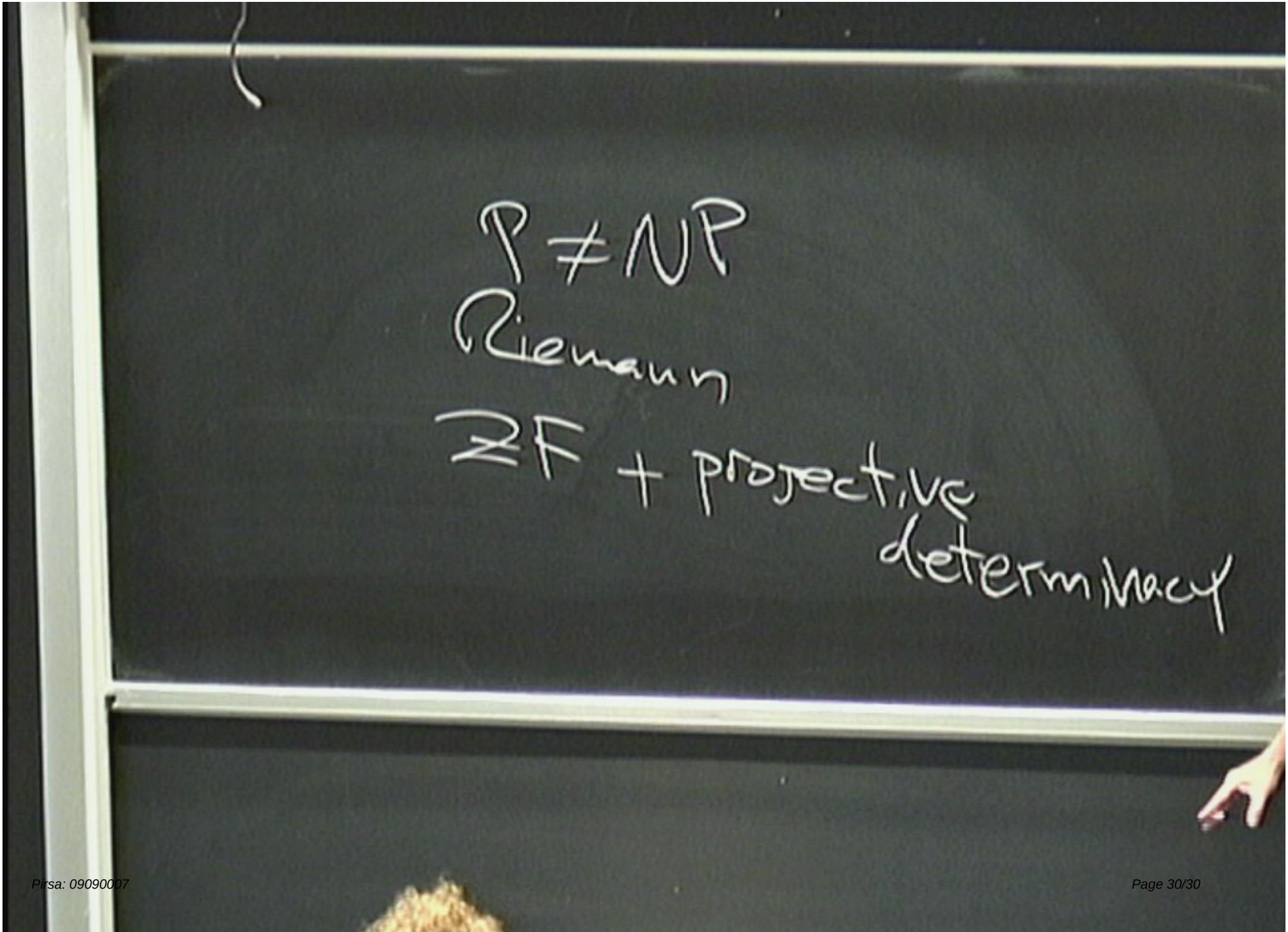

1960s
1970s
$n+1 = \{0, 1, 2, \ldots, n\}$
$n+H(n)$
$U(T, P) = C(P)$
00001
$0 \to 00$ $1 \to 11$ 01


$\Omega = \sum 2^{-|p|}$
p halts
p has k bits
⇒ contributes
$1/2^k$


$\Omega = \sum 2^{-|p|} < 1$
p halts
p has k bits
contributes
1/2^k
exp
( )


P≠NP


P≠NP
Riemann


P ≠ NP
Riemann
ZF + projective
determinacy