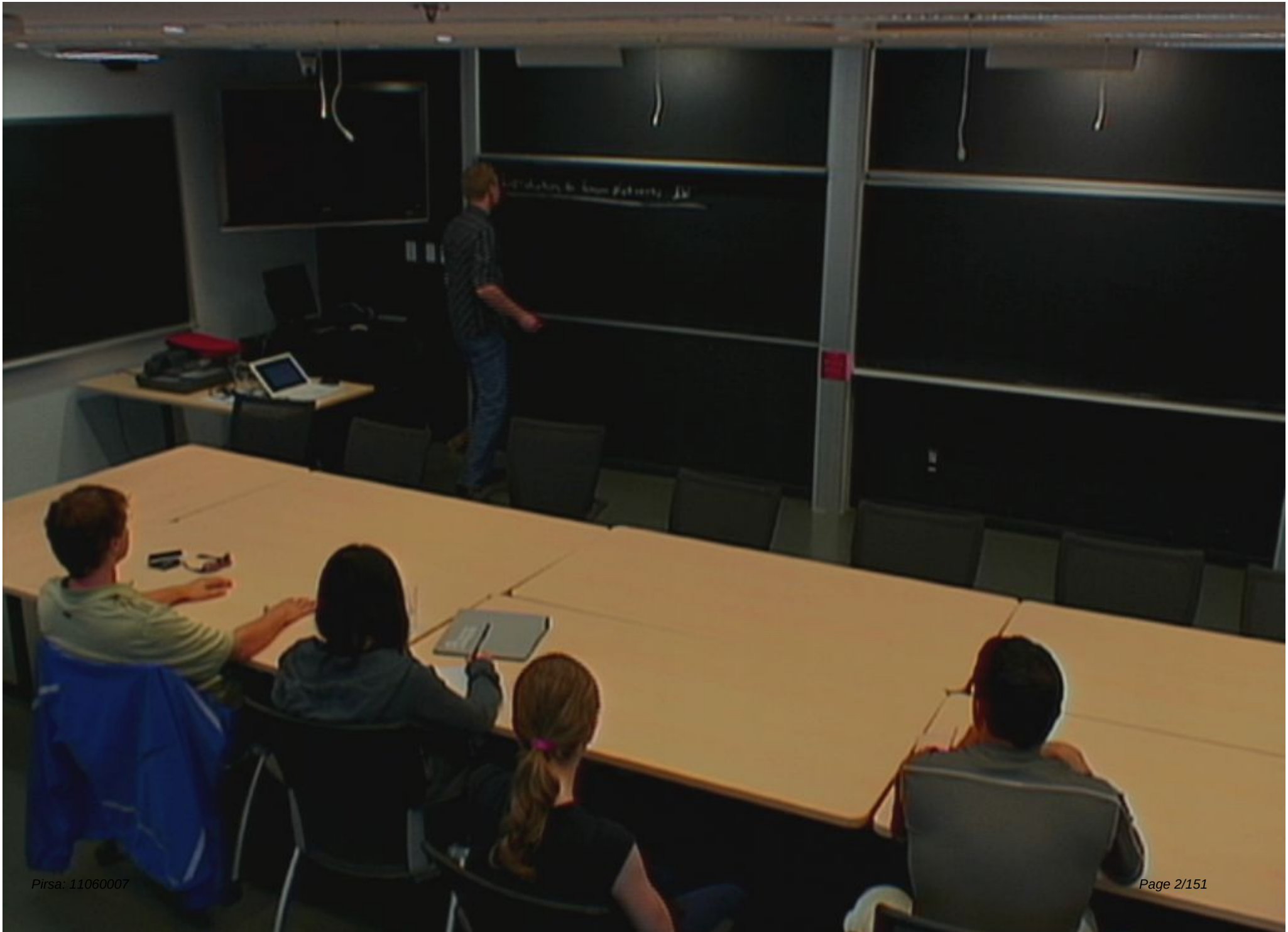
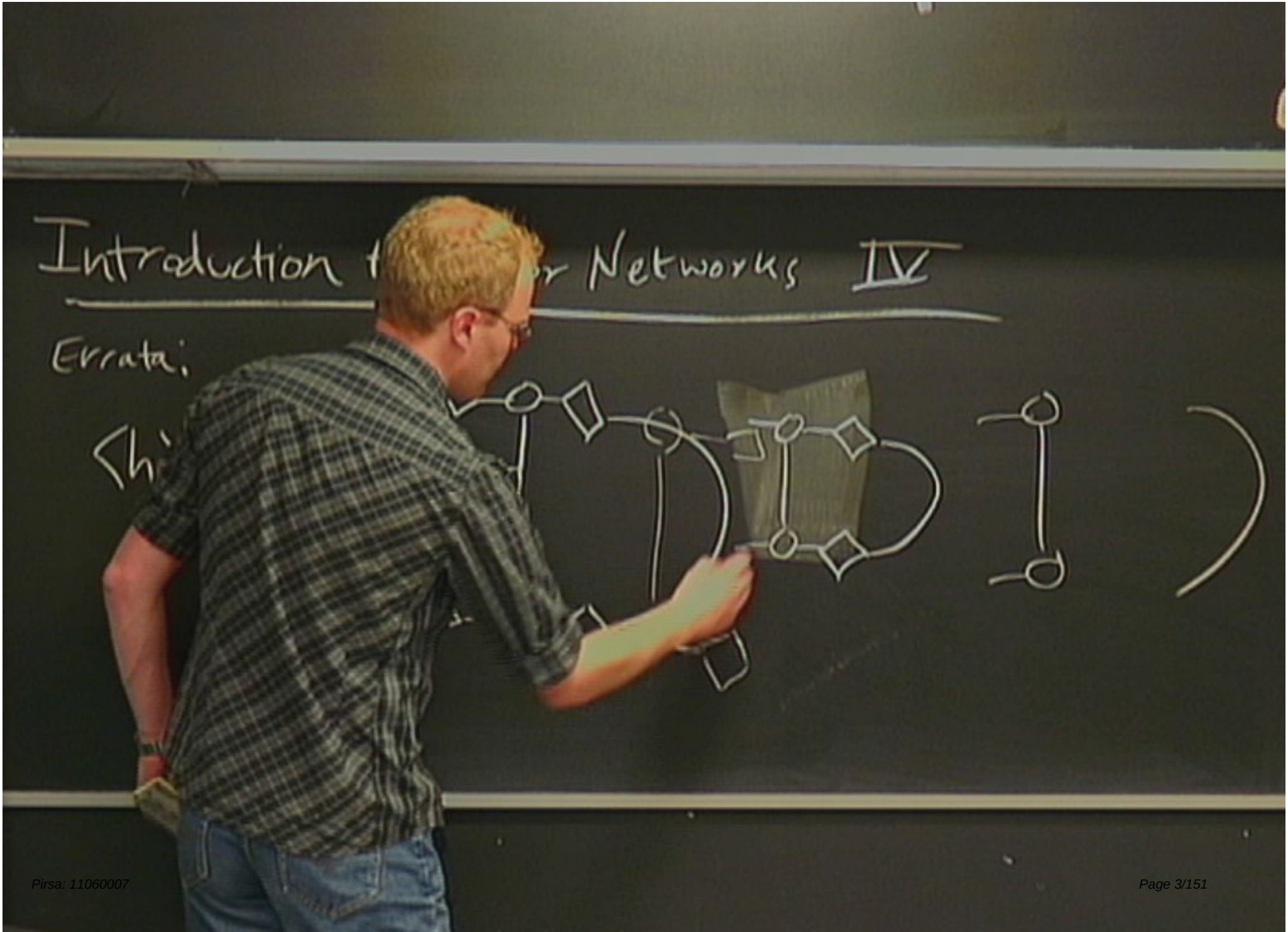
Title: Introduction to Tensor Network Algorithms - Lecture 4

Date: Jun 17, 2011 01:30 PM

URL: http://pirsa.org/11060007

Abstract: Tensor network algorithms are a powerful technique for the study of quantum systems in condensed matter physics. In this short series of lectures, I will present an applied perspective on tensor network algorithms. Topics to be covered will include motivation and methodology, graphical notation, Matrix Product States (MPS) and the Time-Evolving Block Decimation (TEBD) algorithm, identifying the capabilities and limitations of tensor network algorithms, the Multi-scale Entanglement Renormalisation Ansatz (MERA) and the study of systems at criticality, and the exploitation of global internal symmetries. The intent of this lecture series is to provide attendees with the necessary theoretical background to be able to understand and implement the more common tensor network algorithms.

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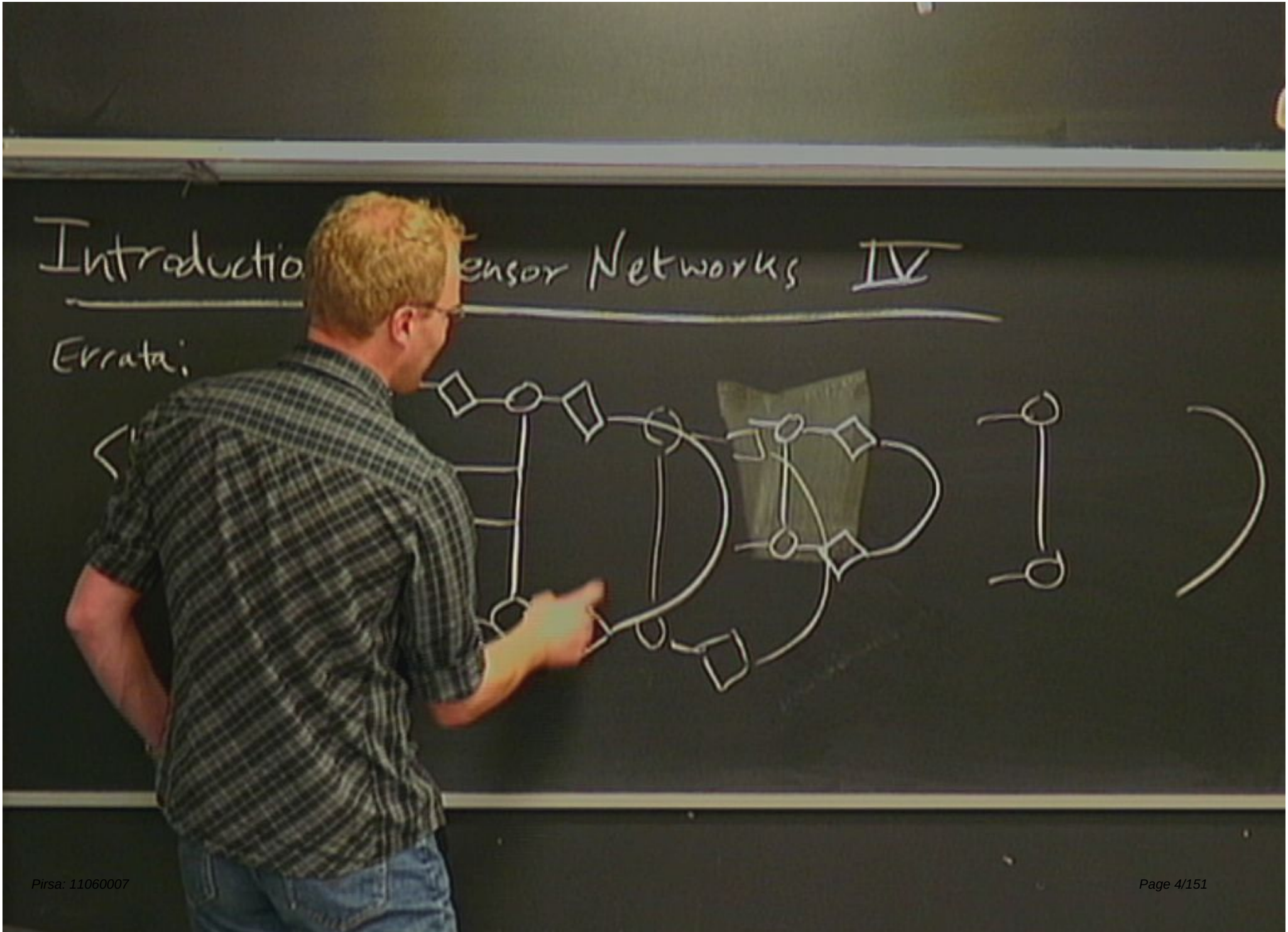
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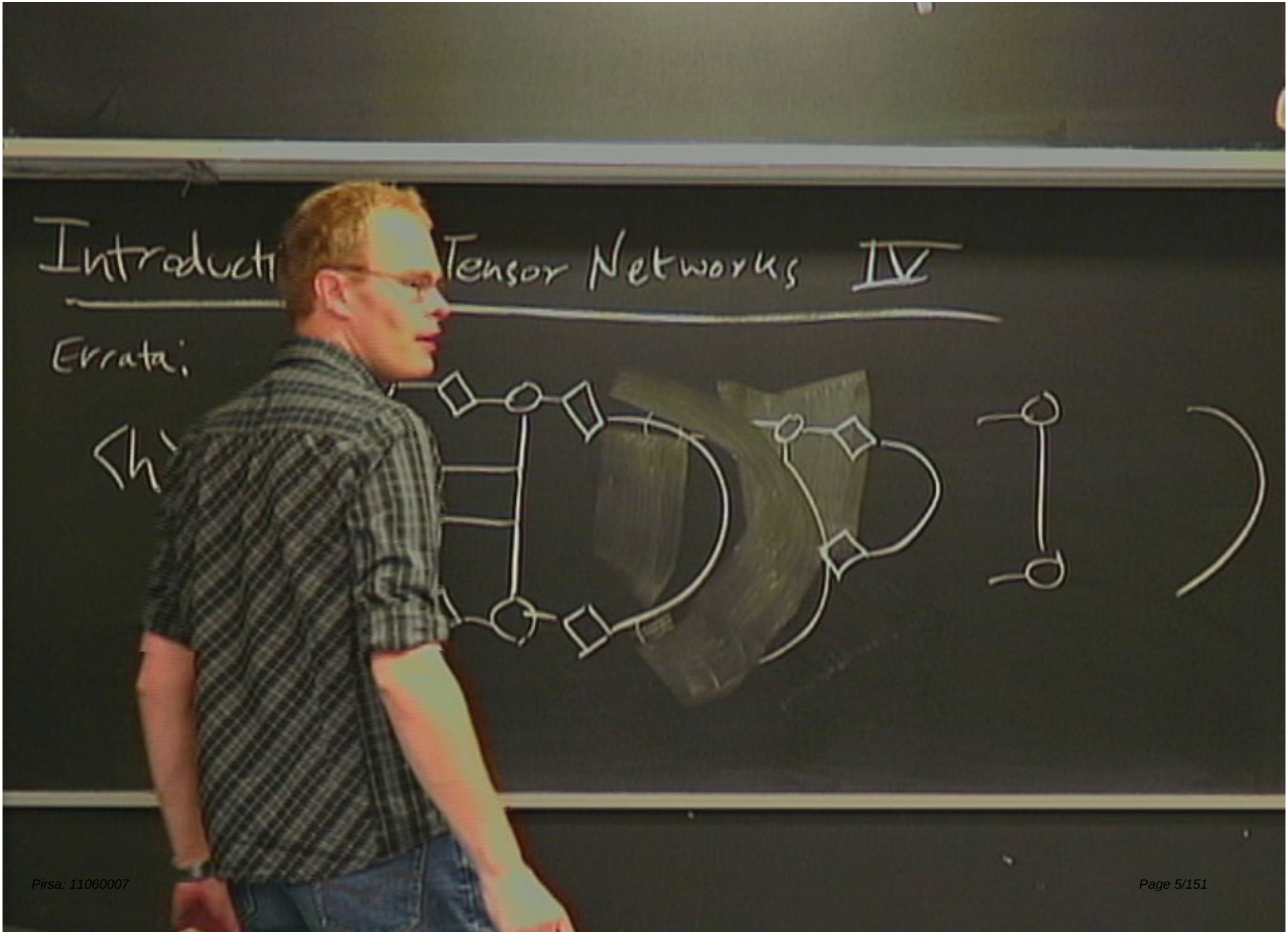
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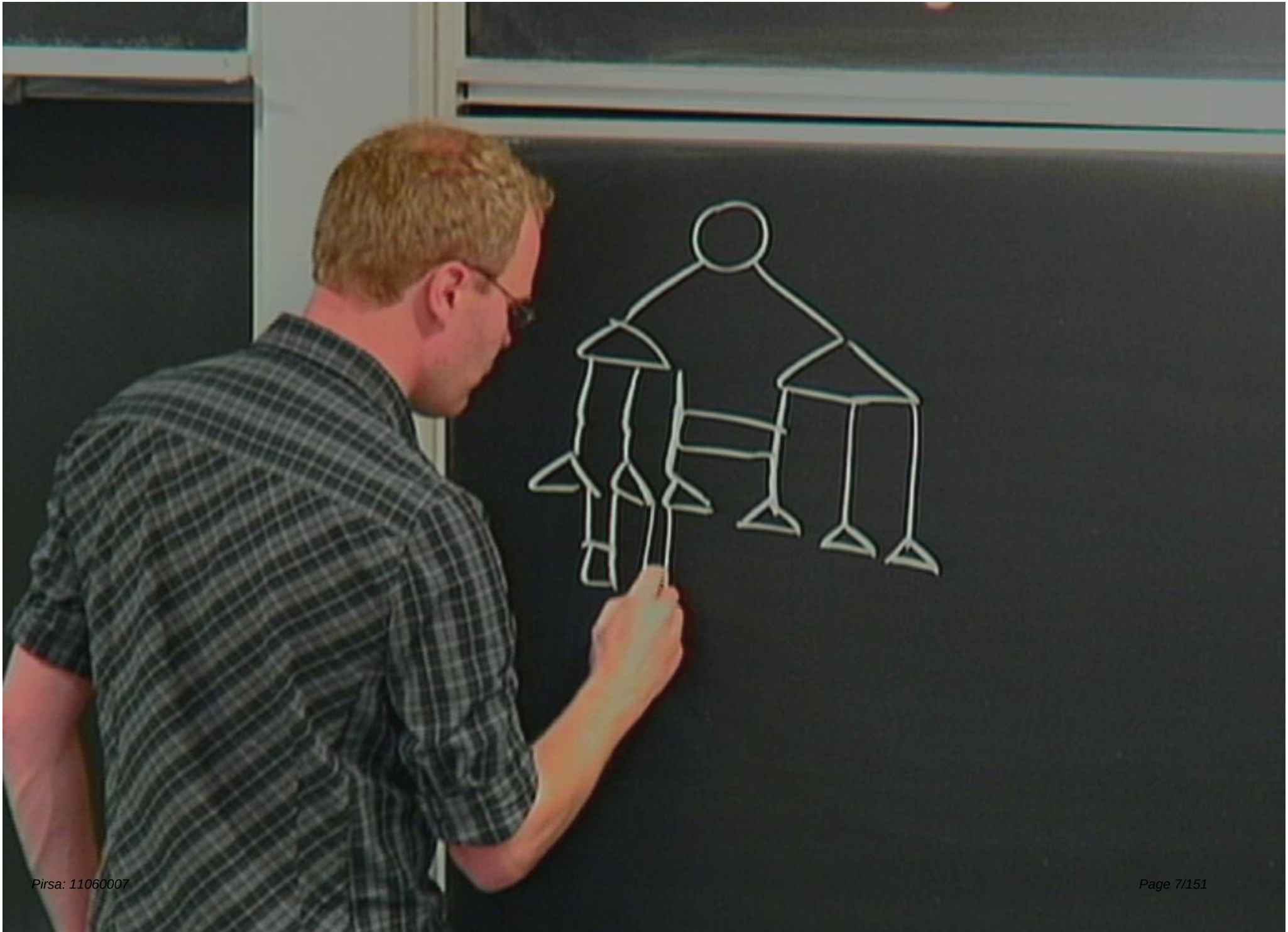

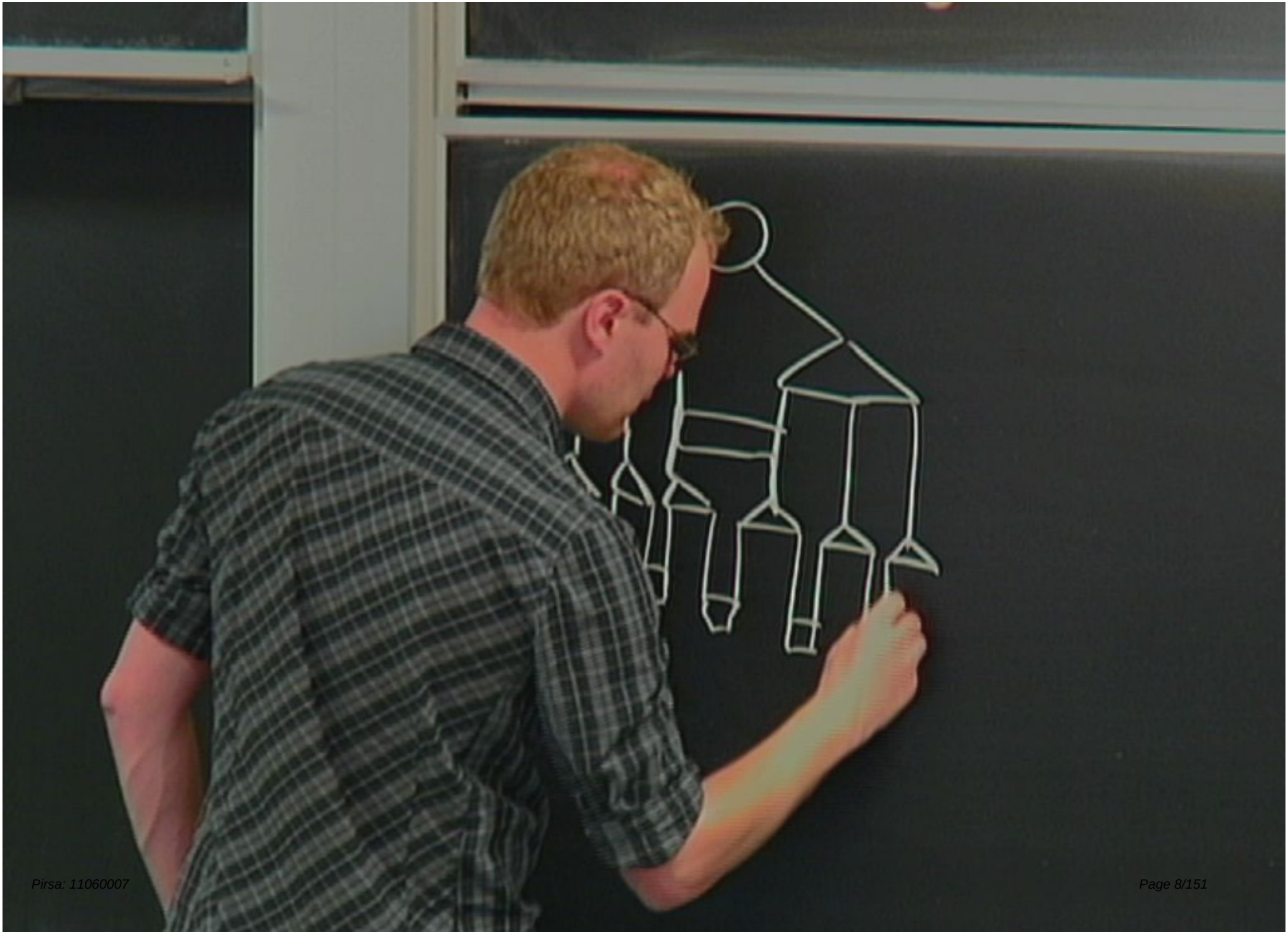

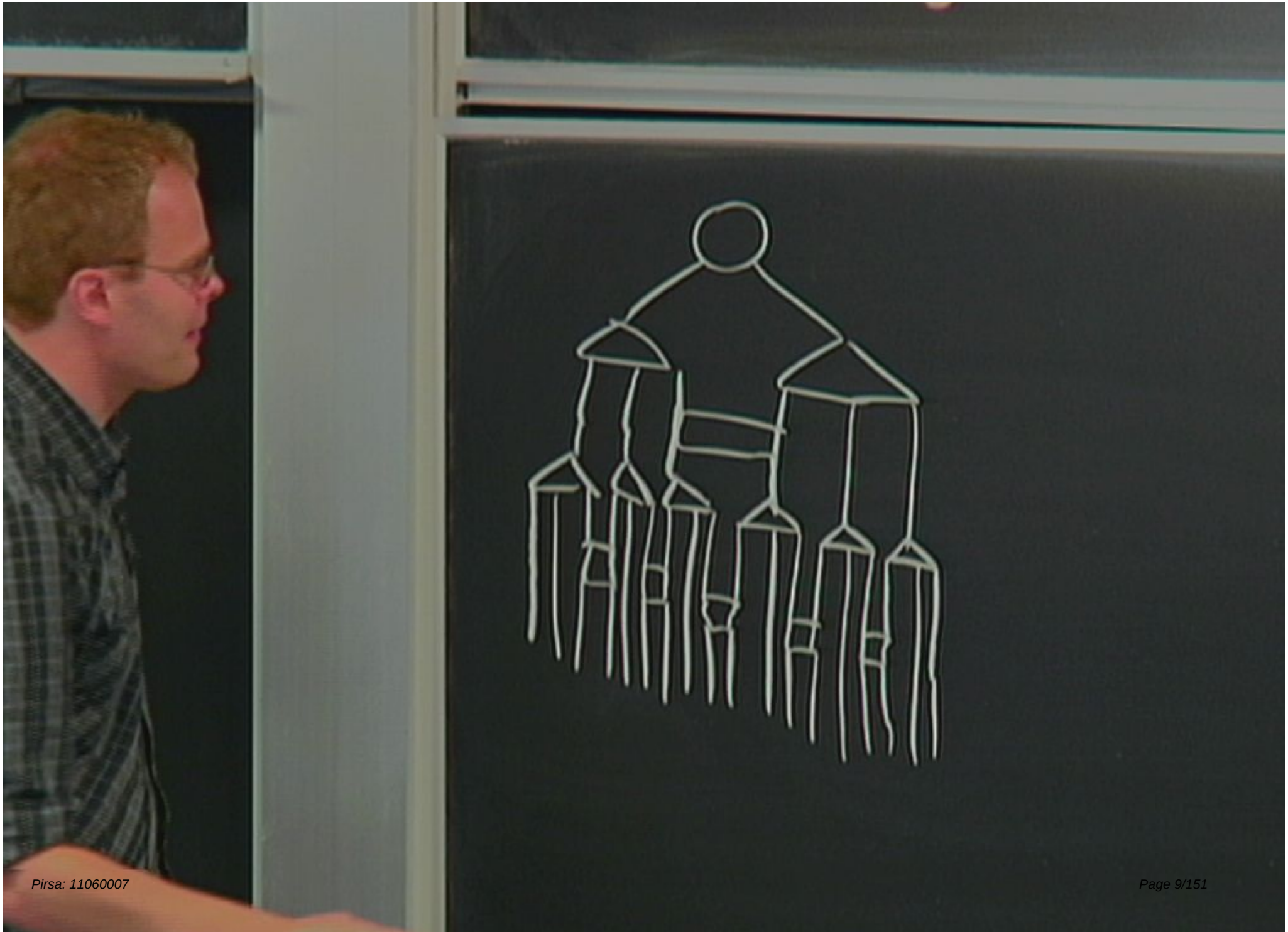

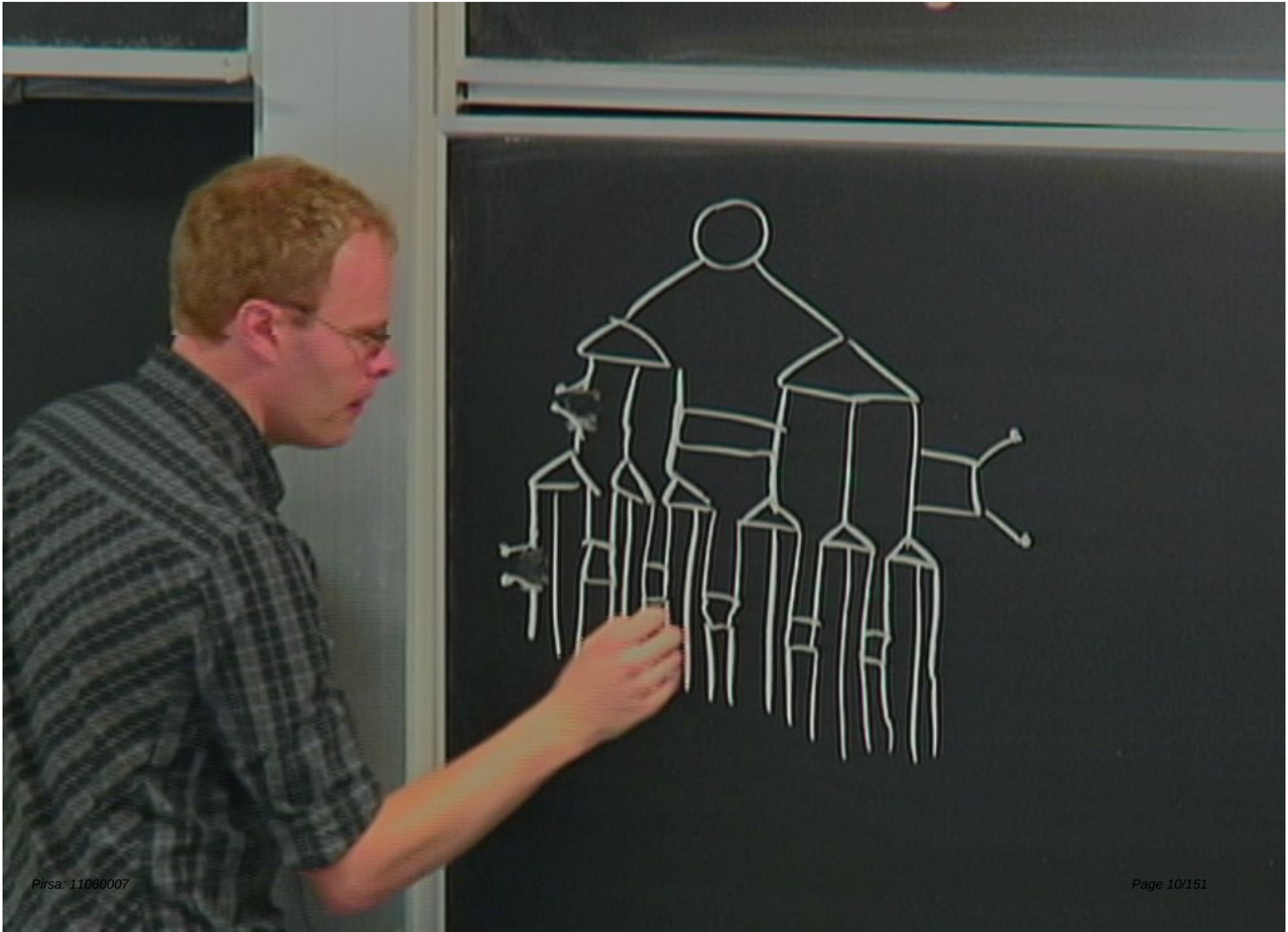

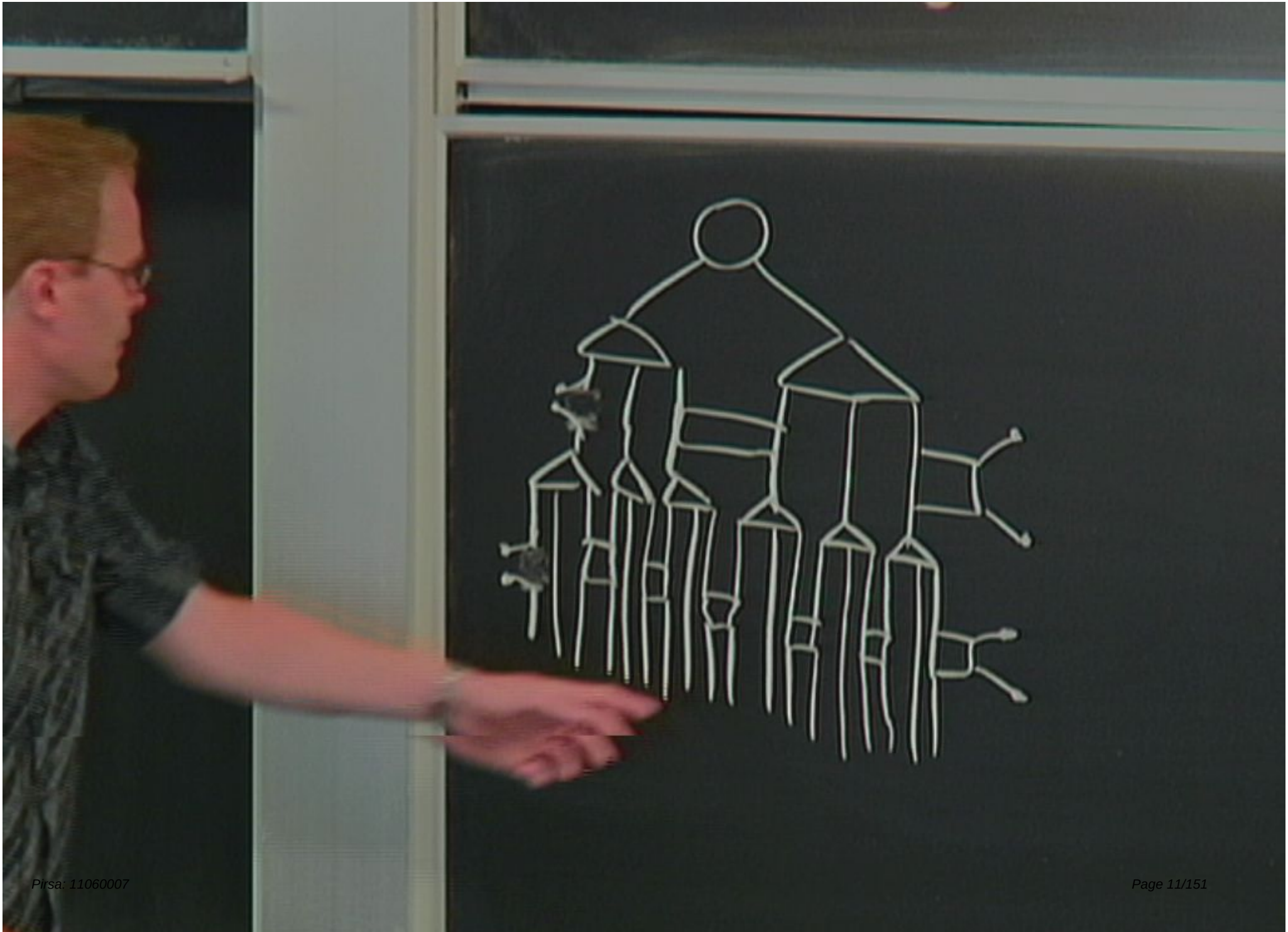

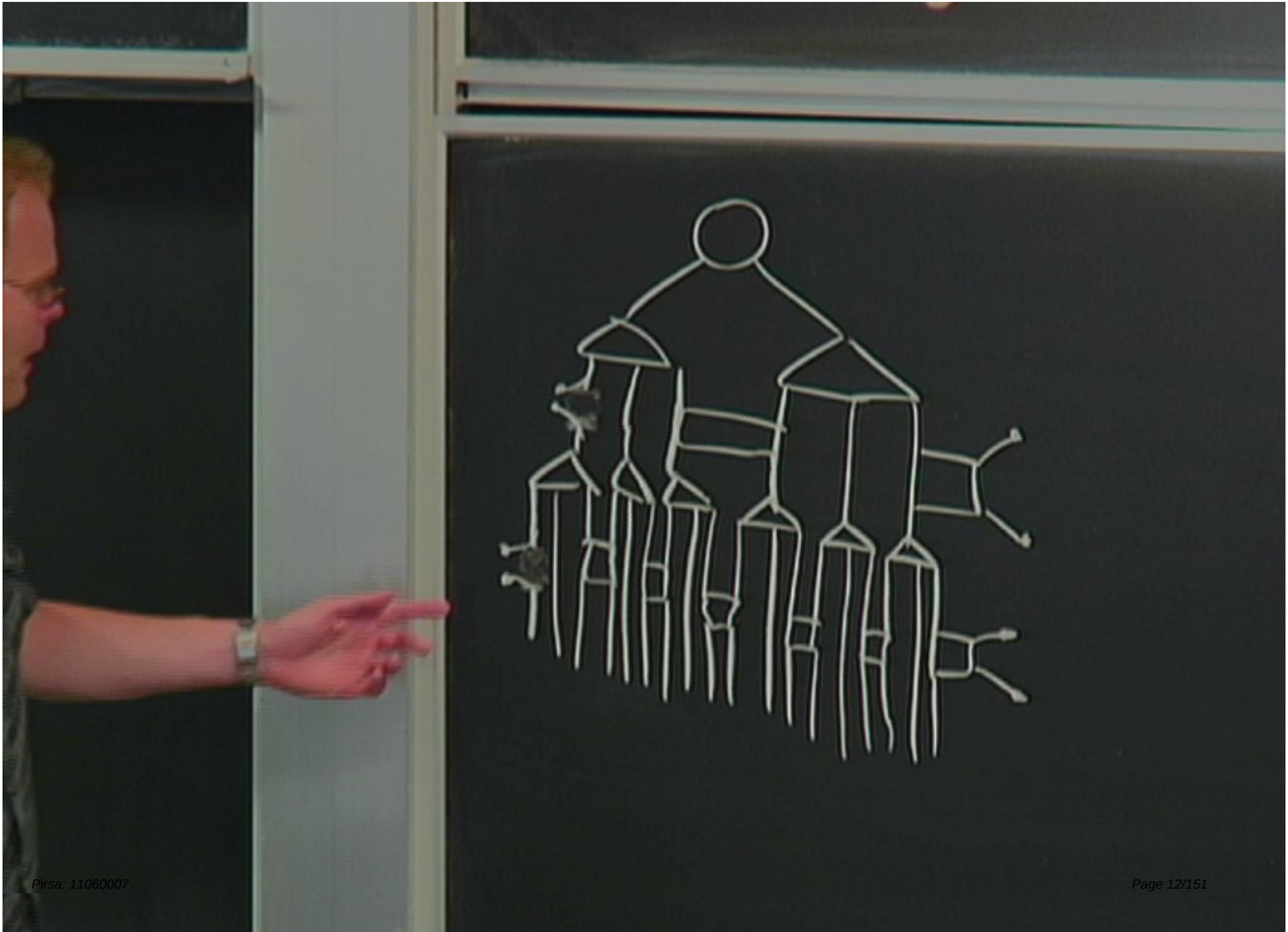

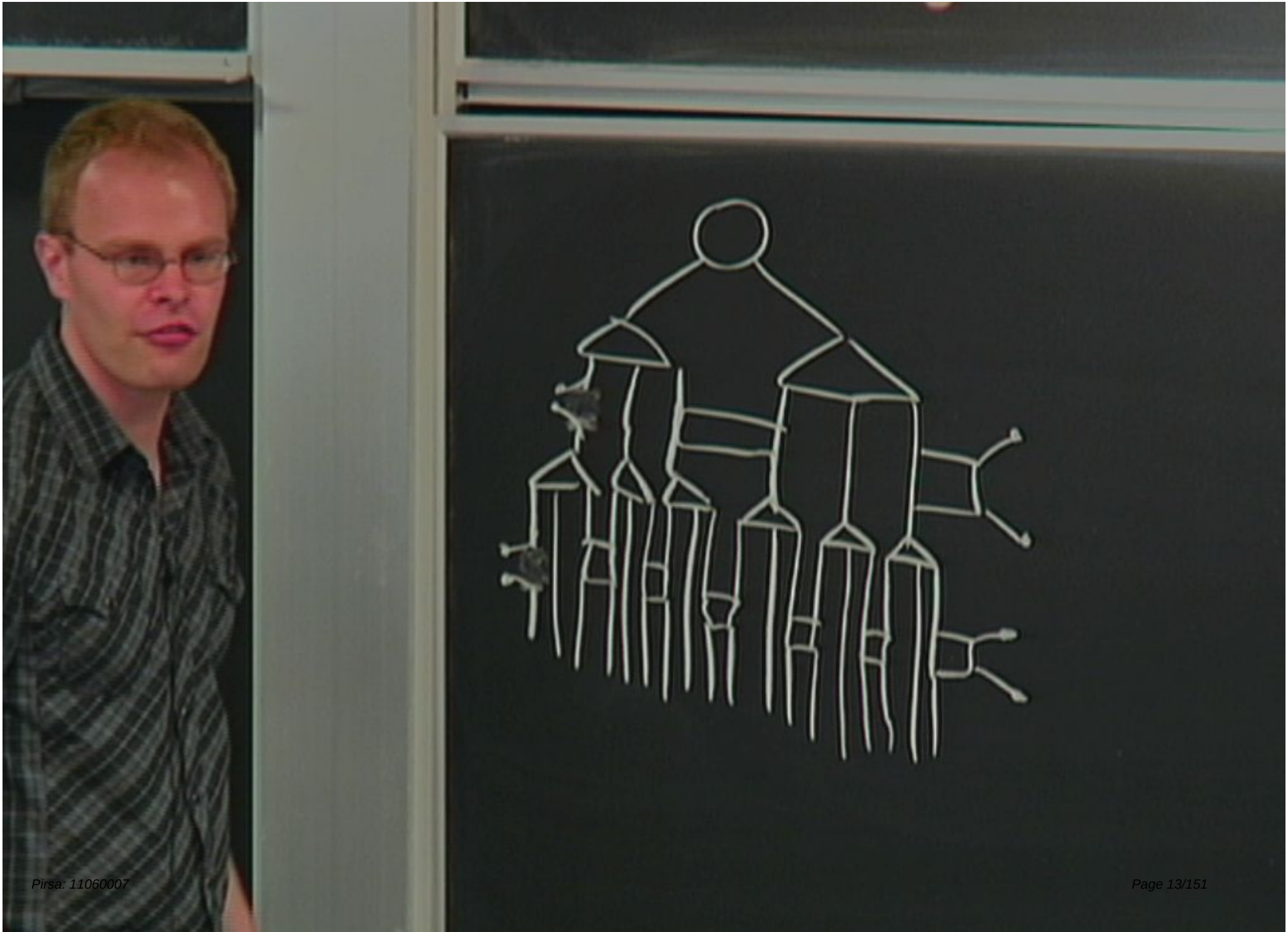

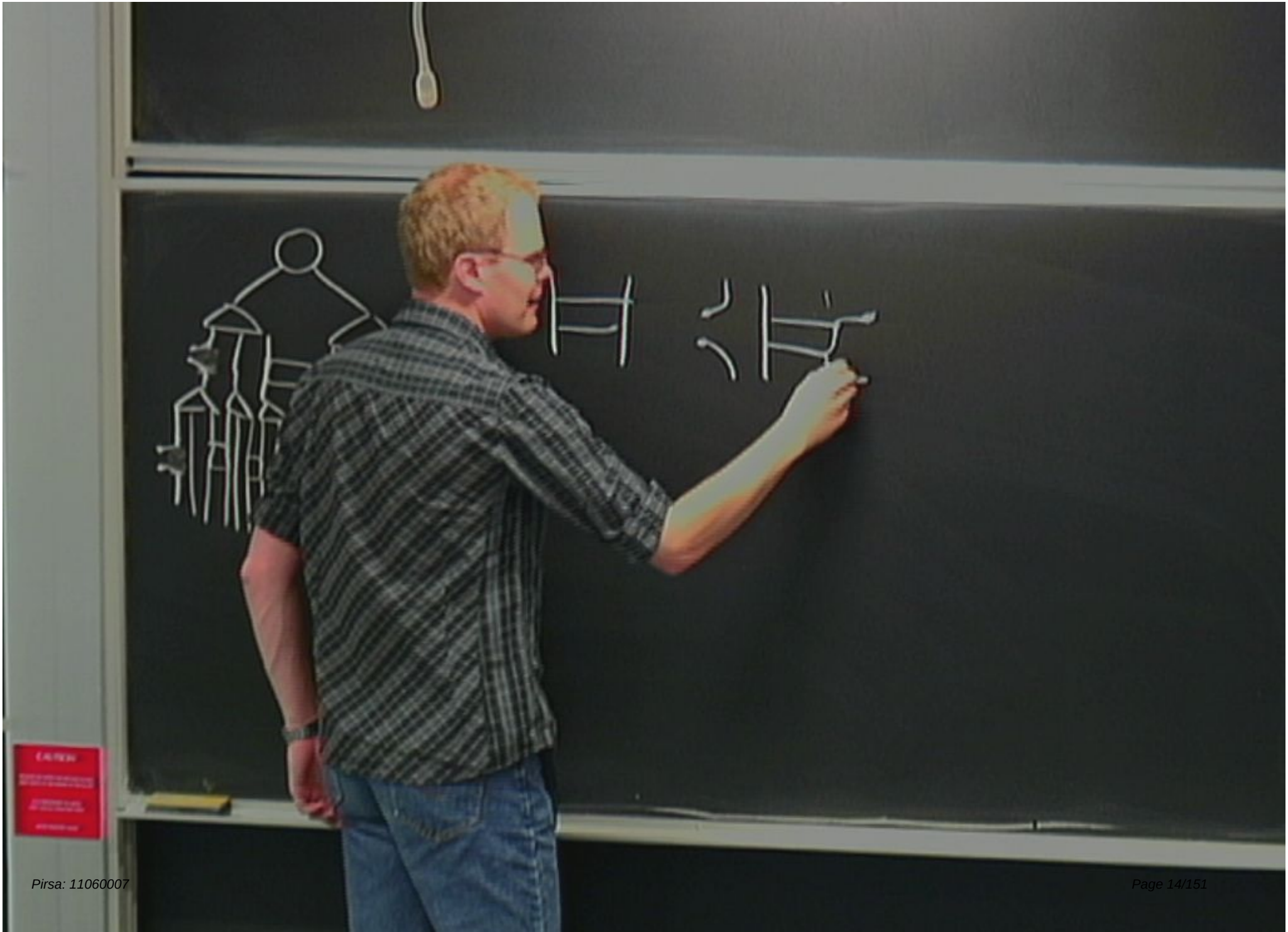

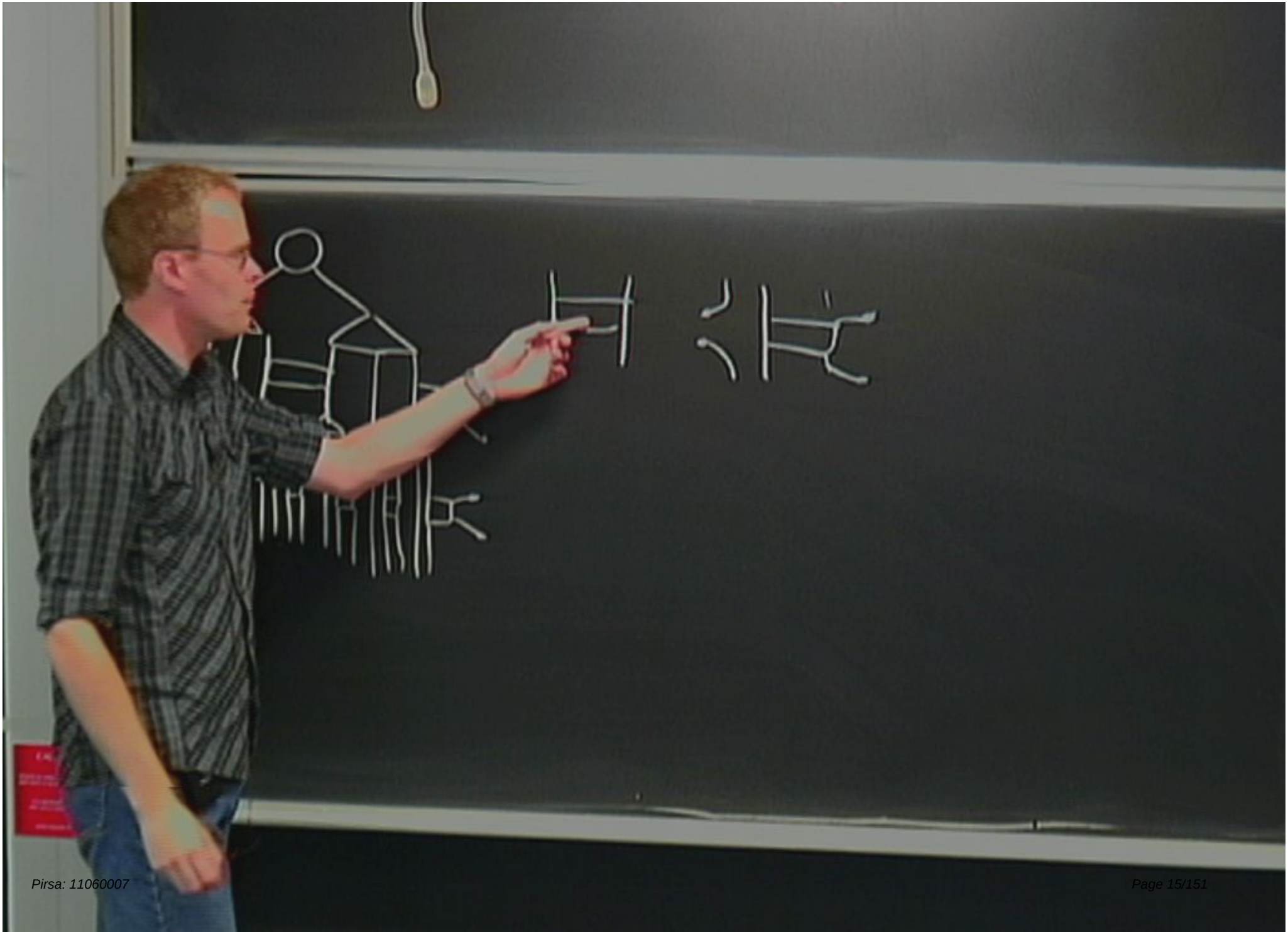

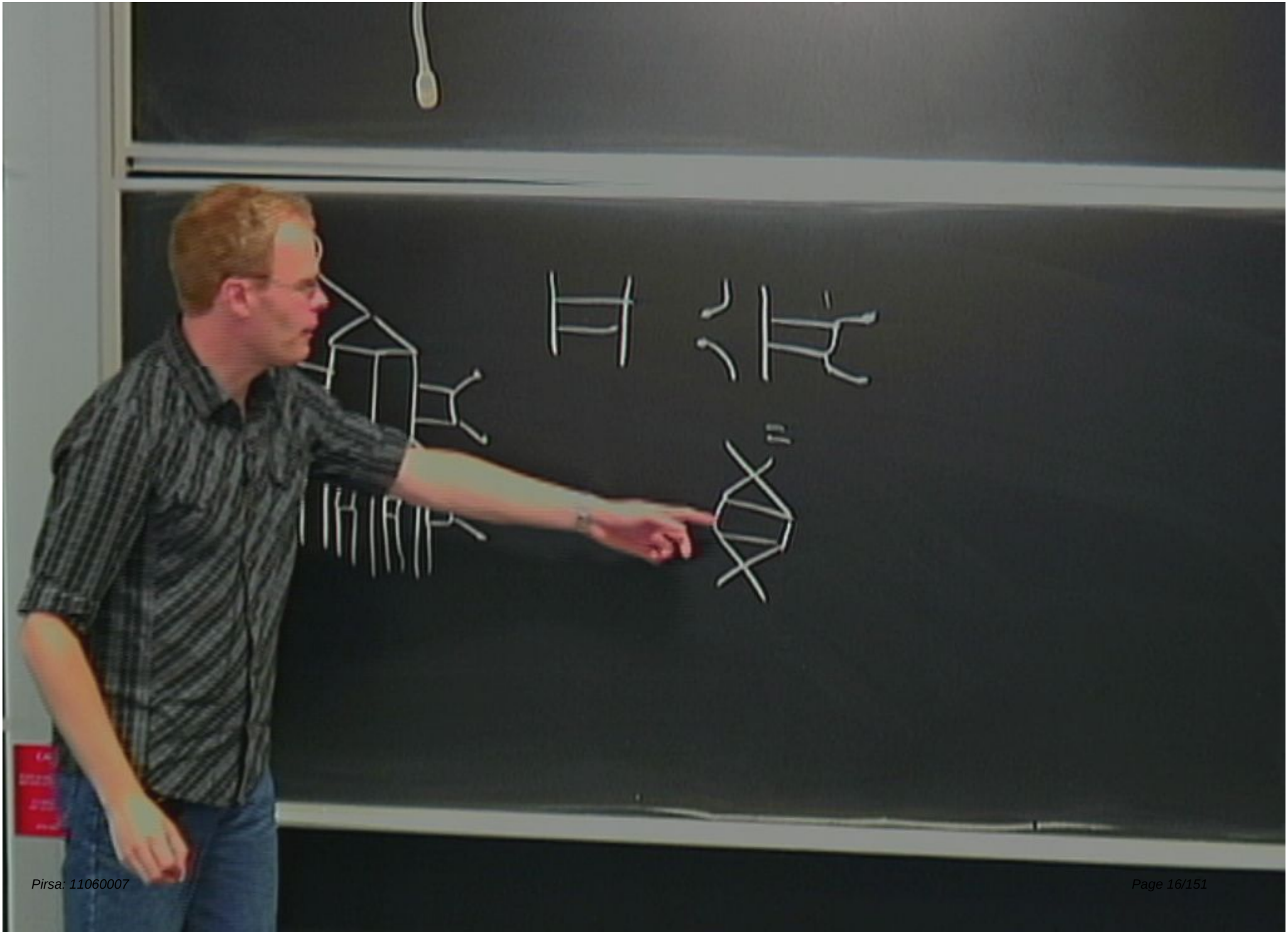

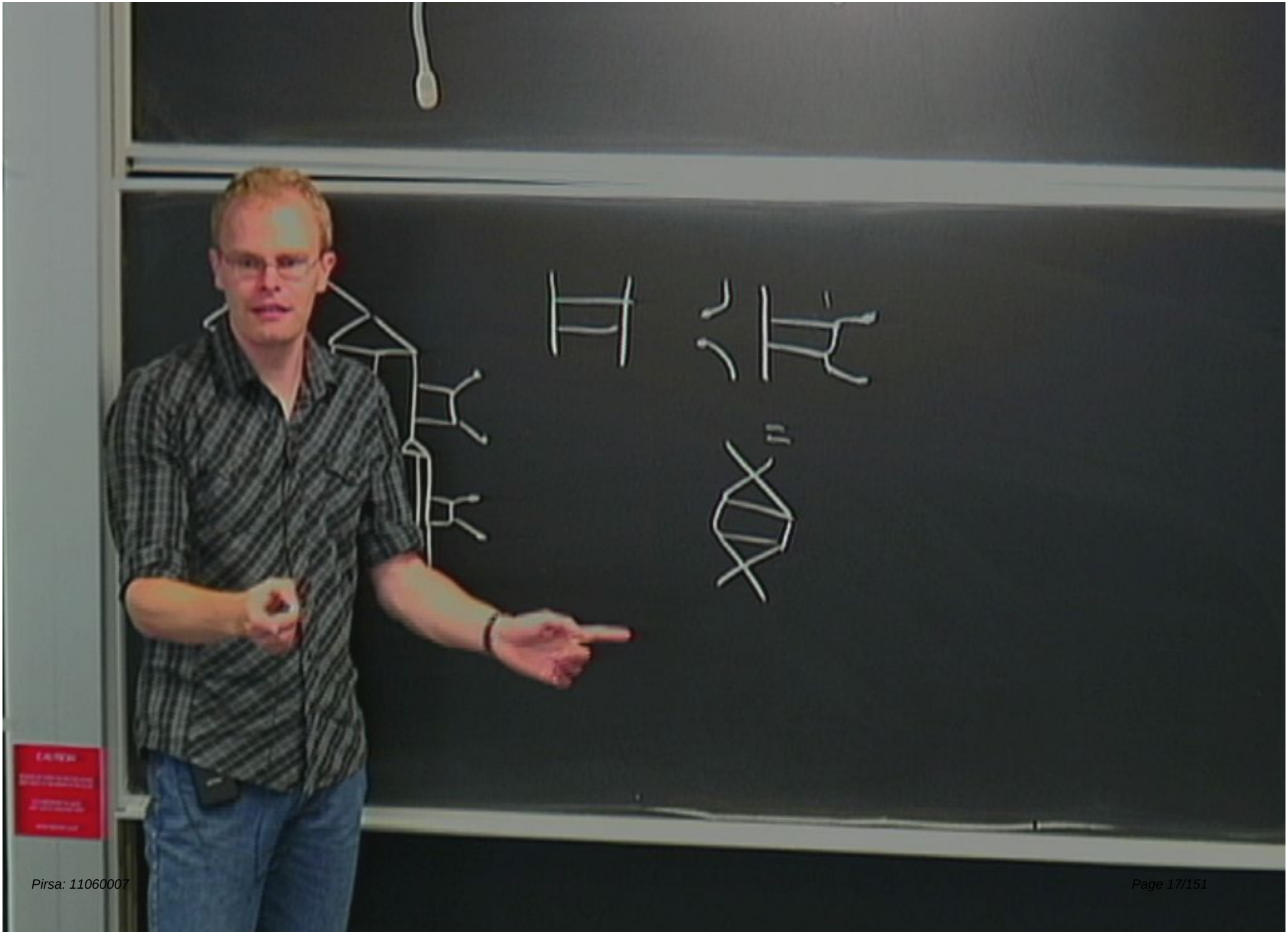

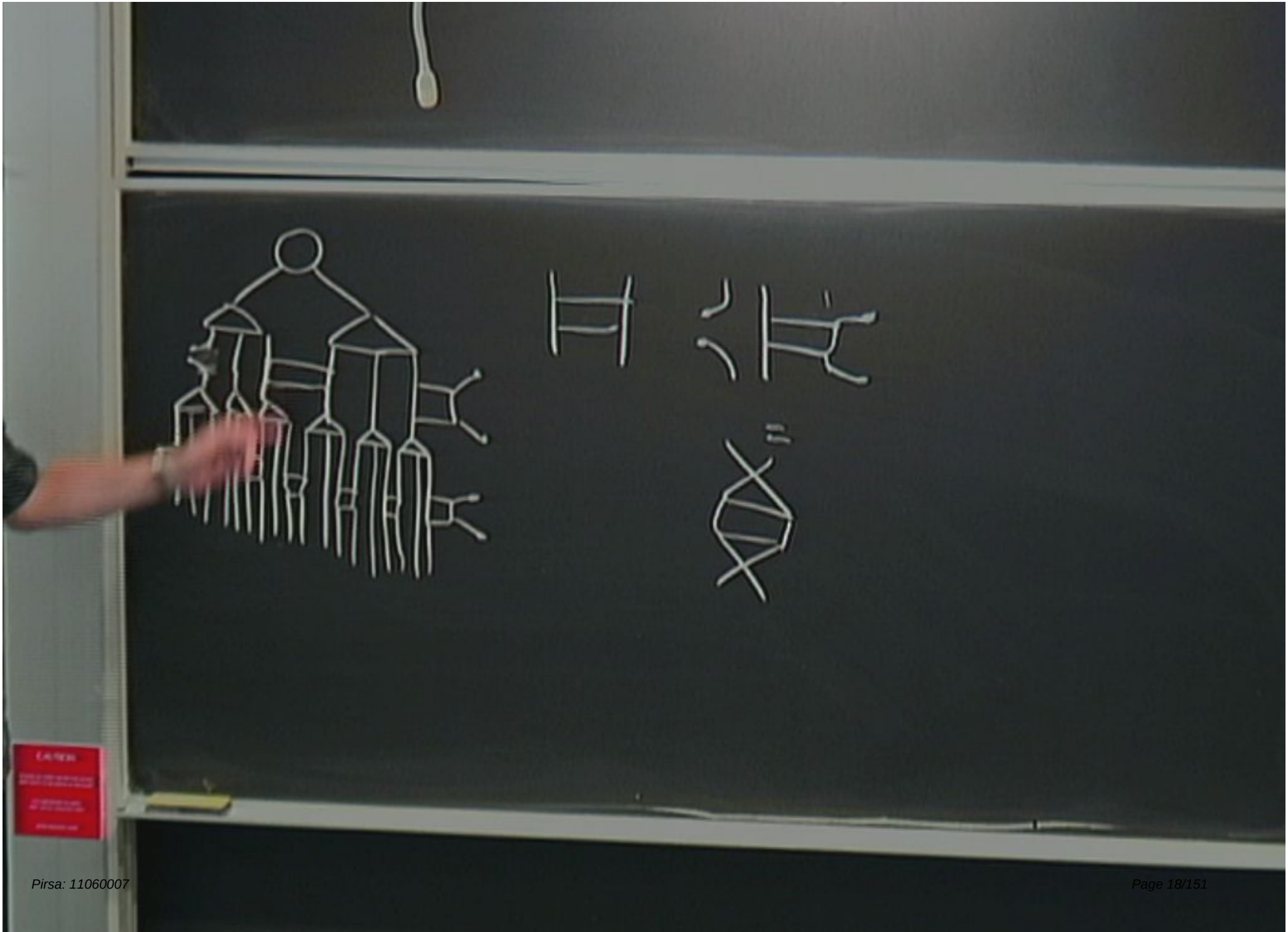

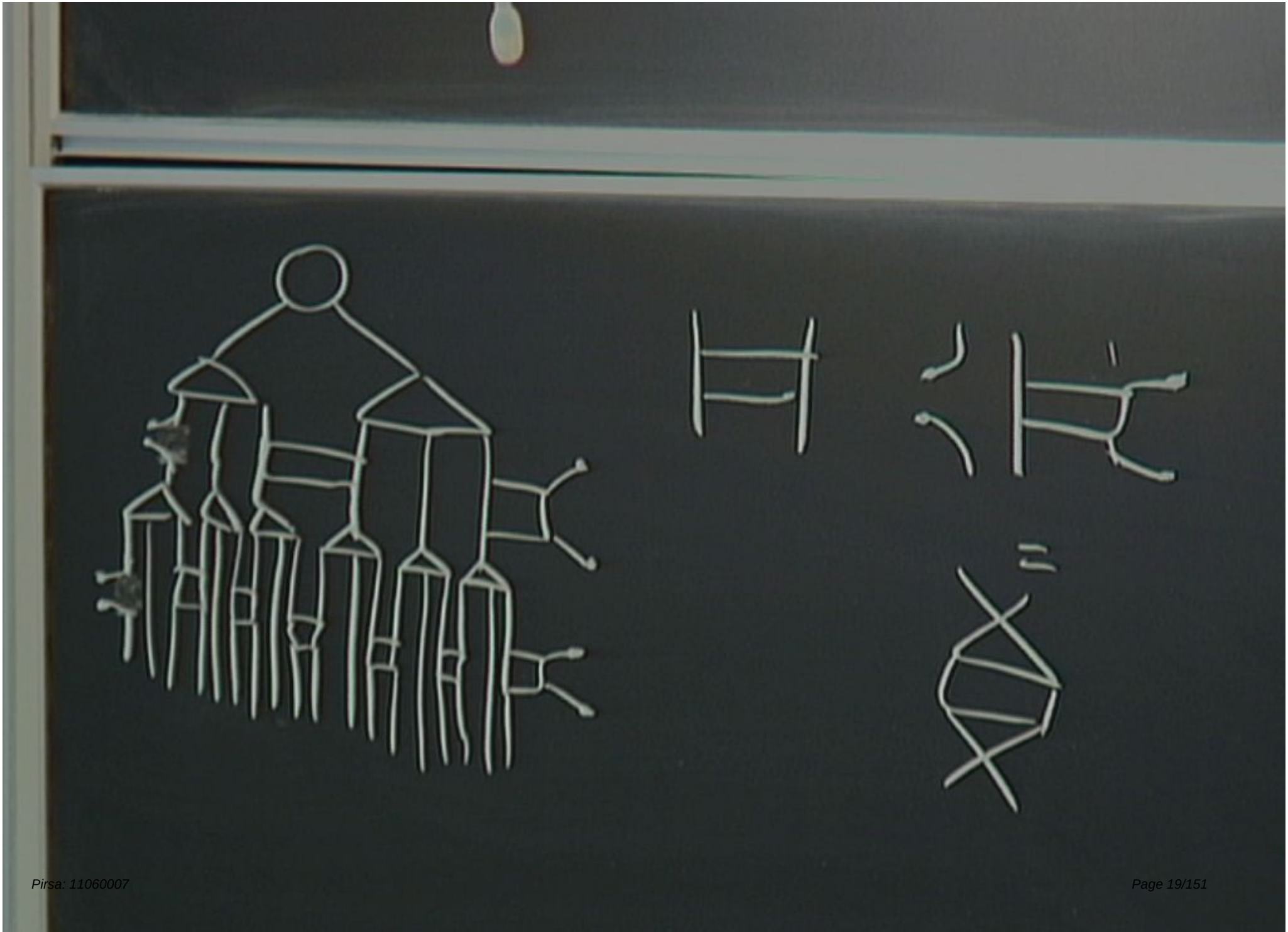

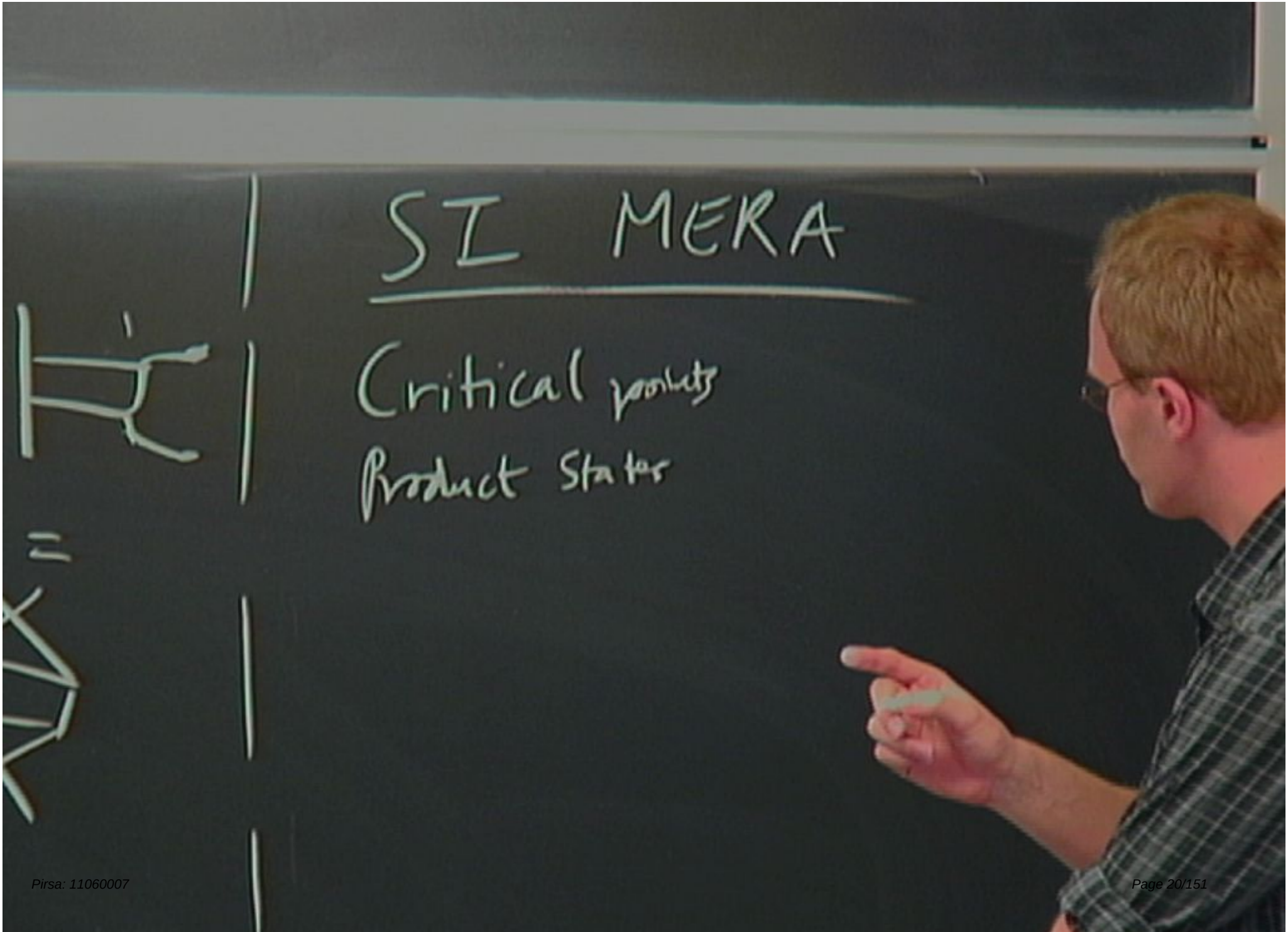
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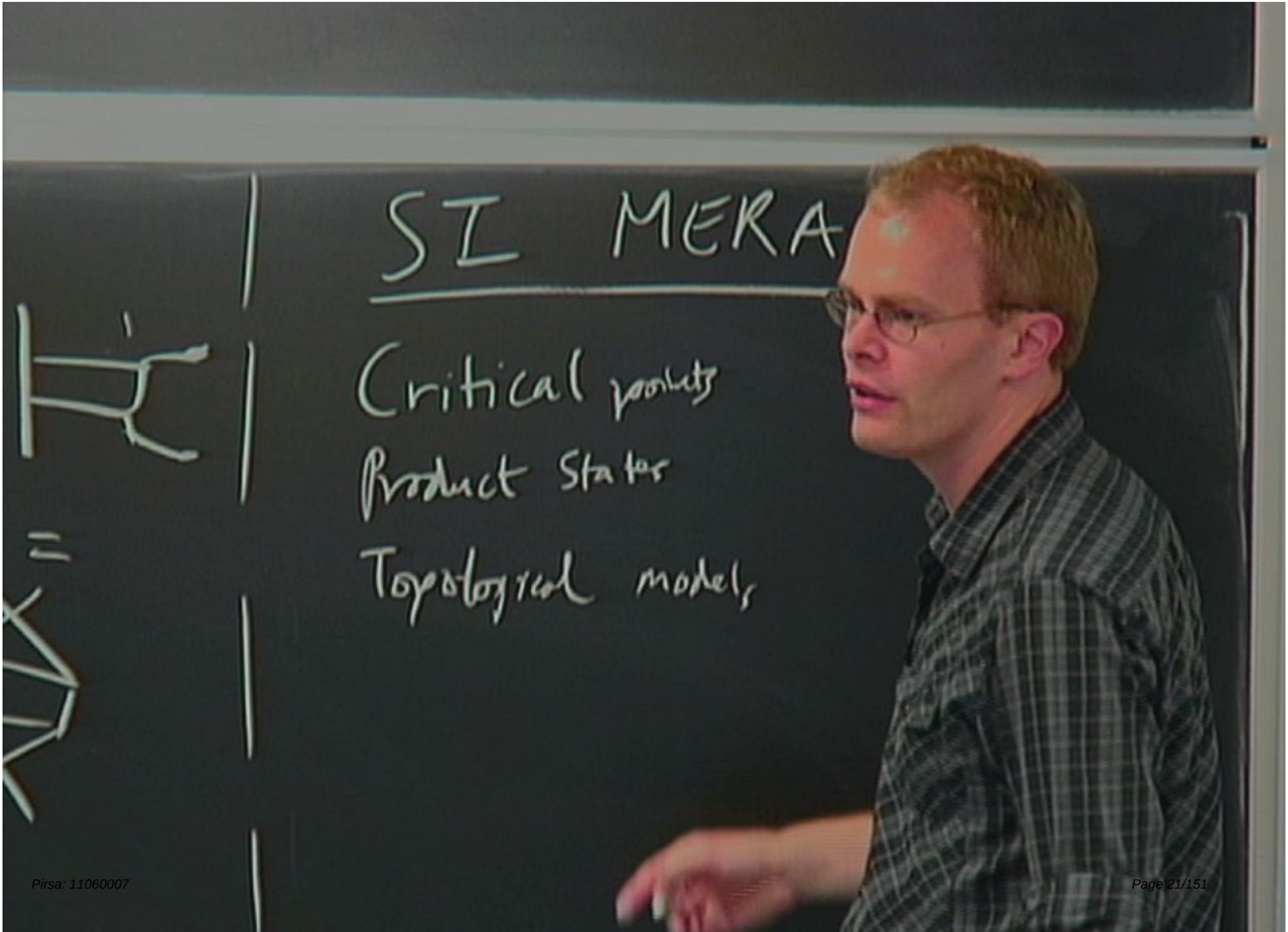
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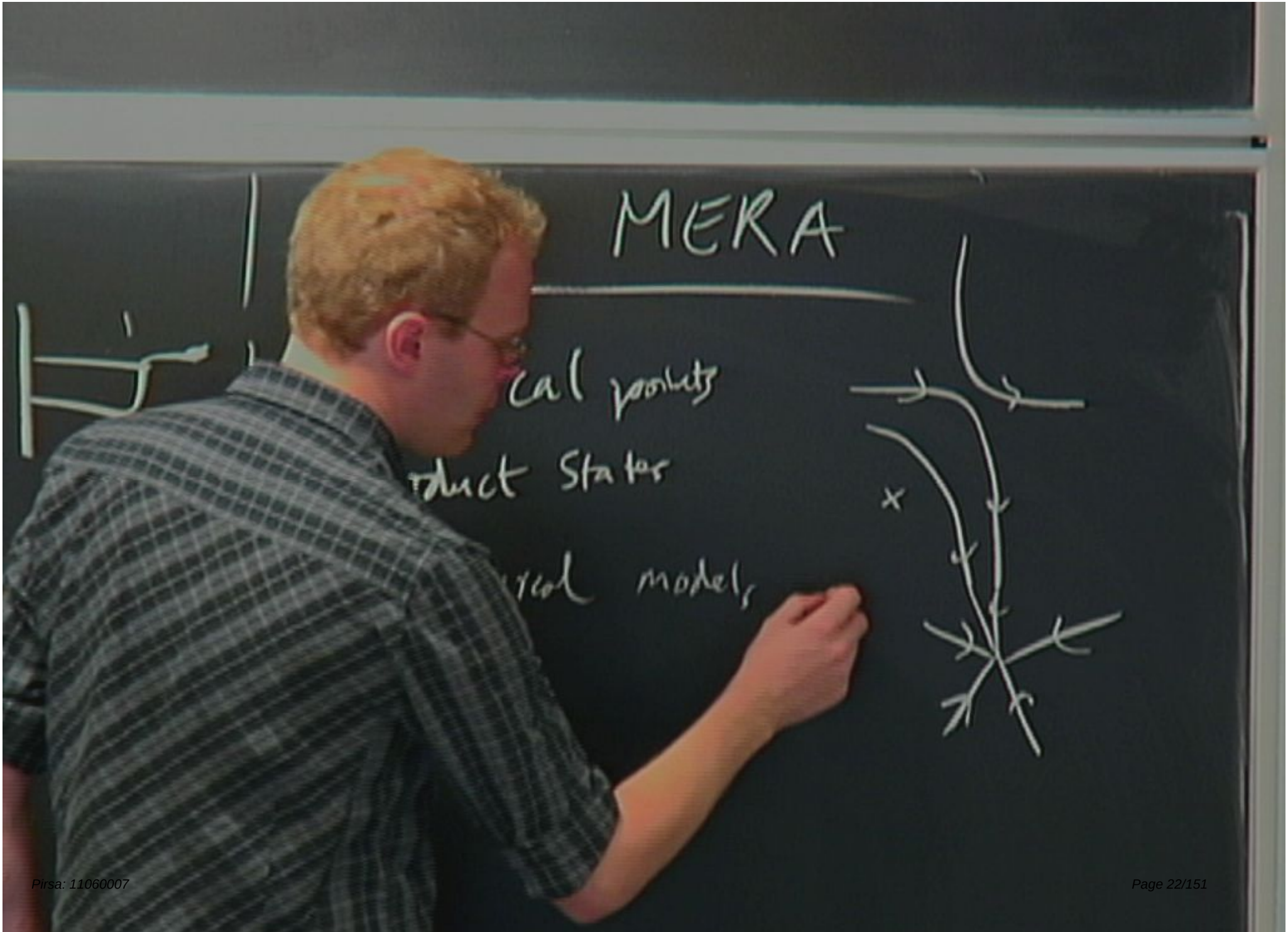
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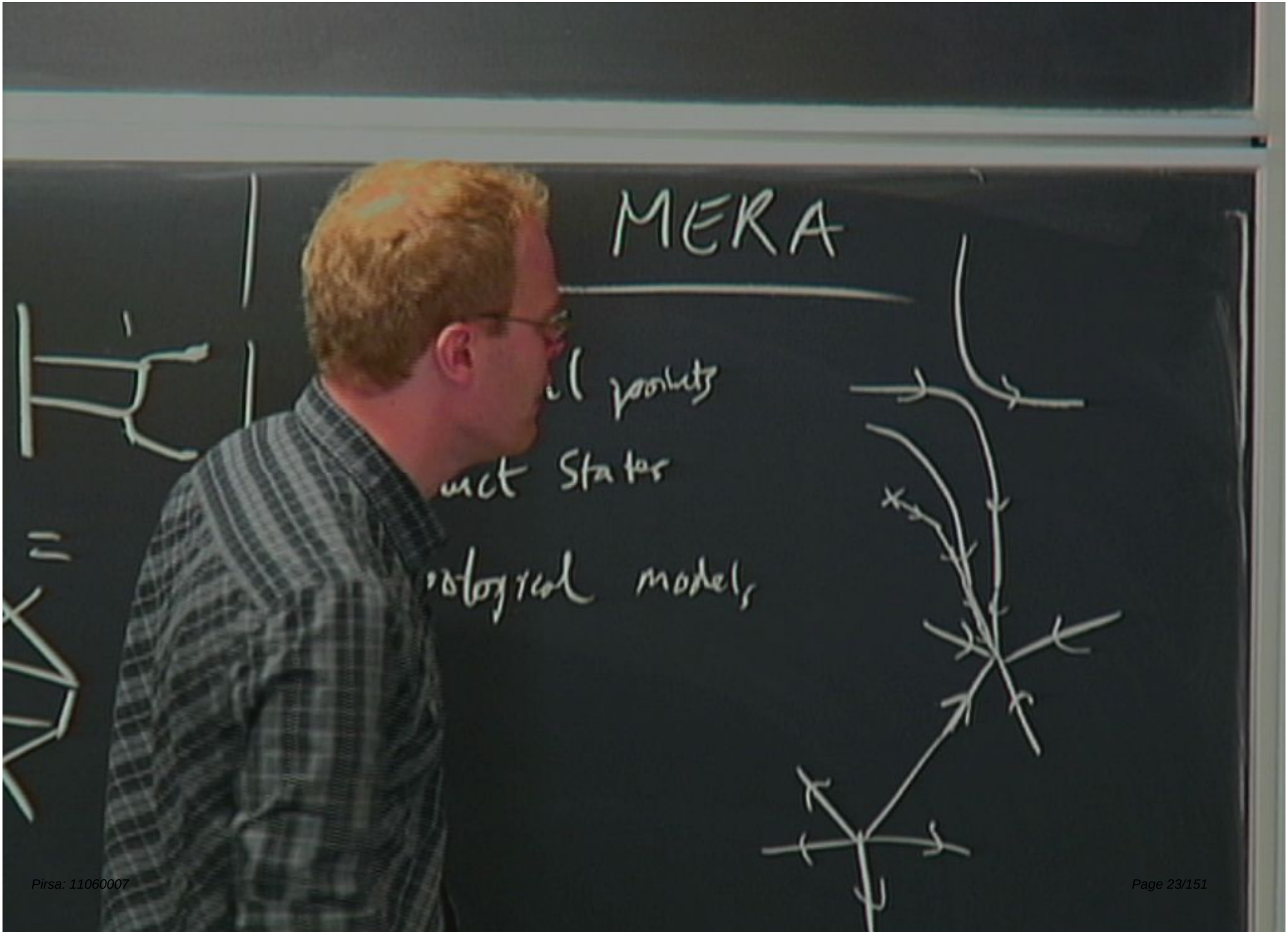
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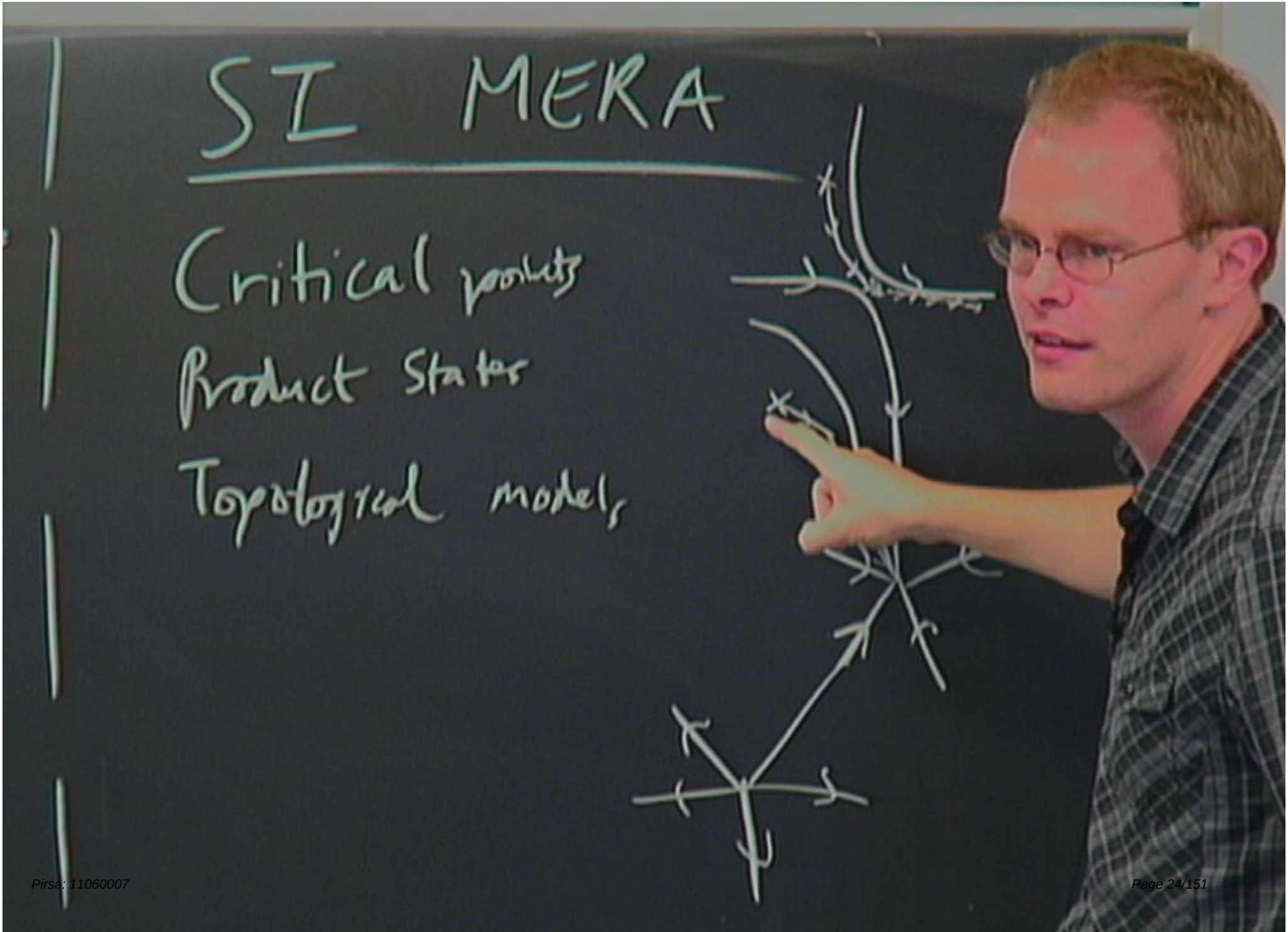
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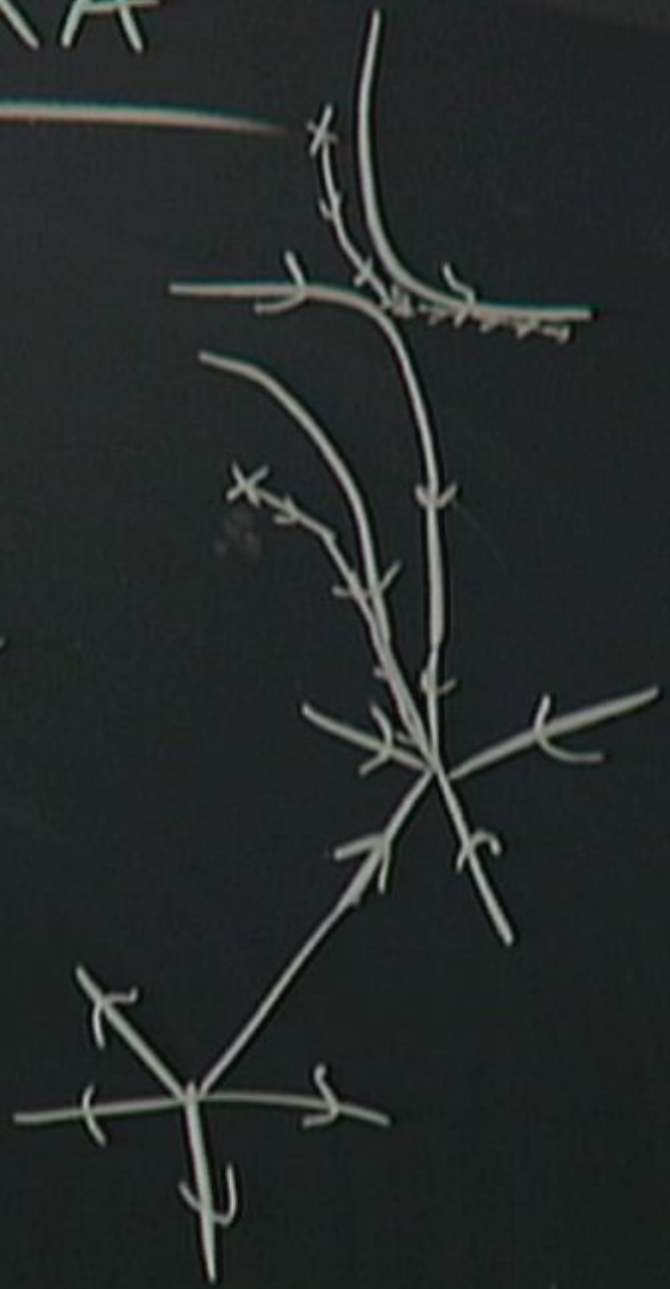

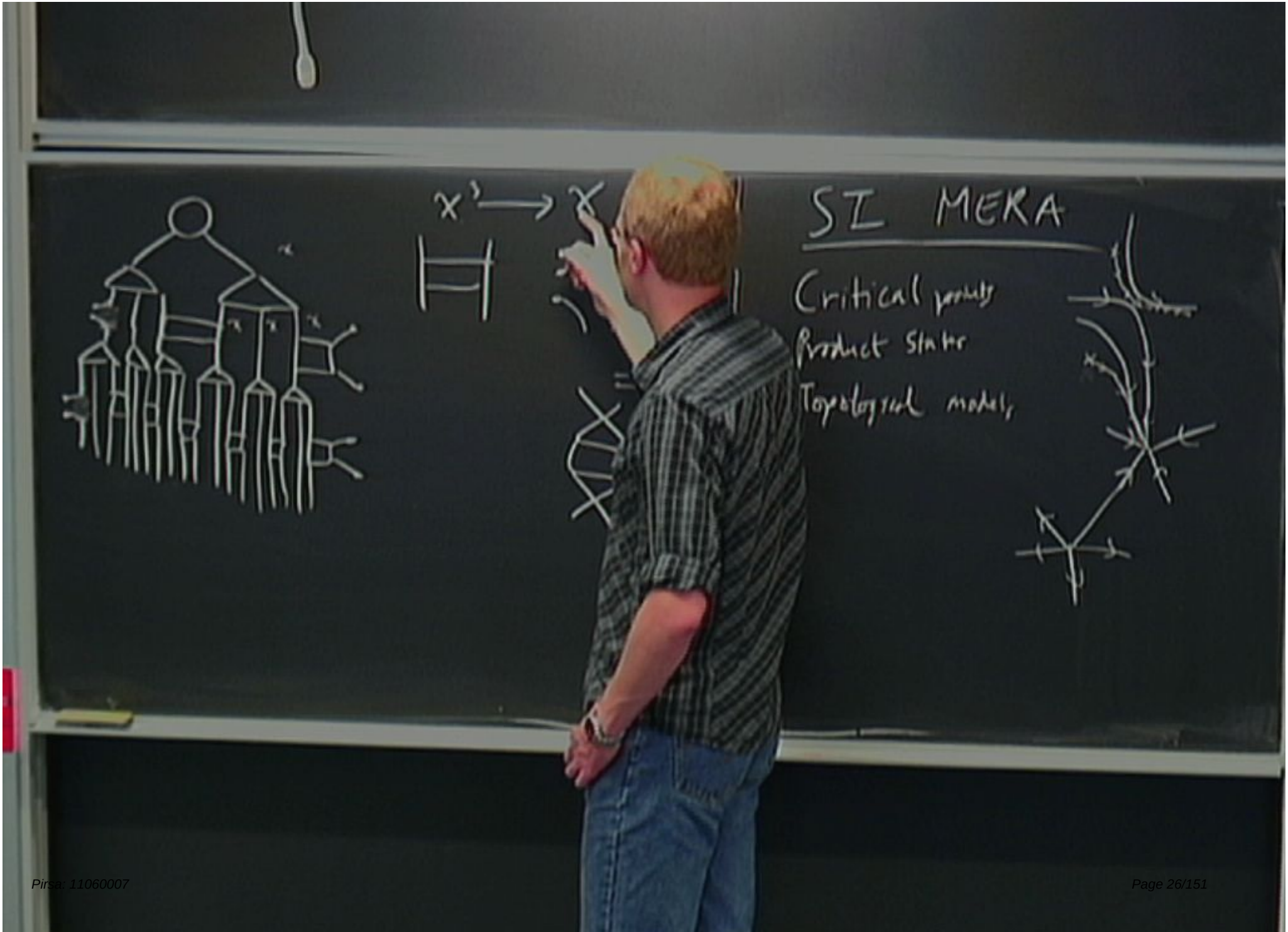
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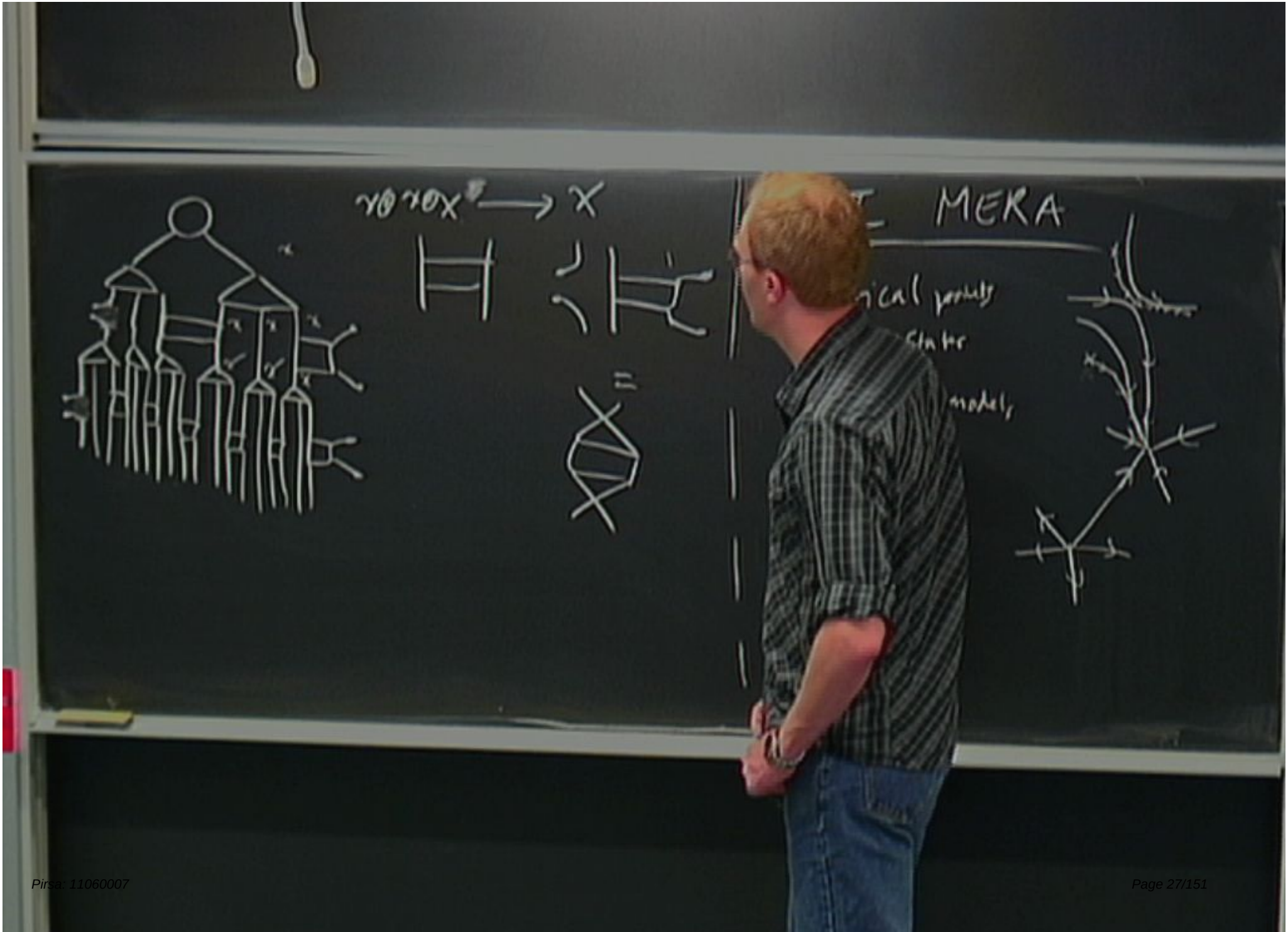
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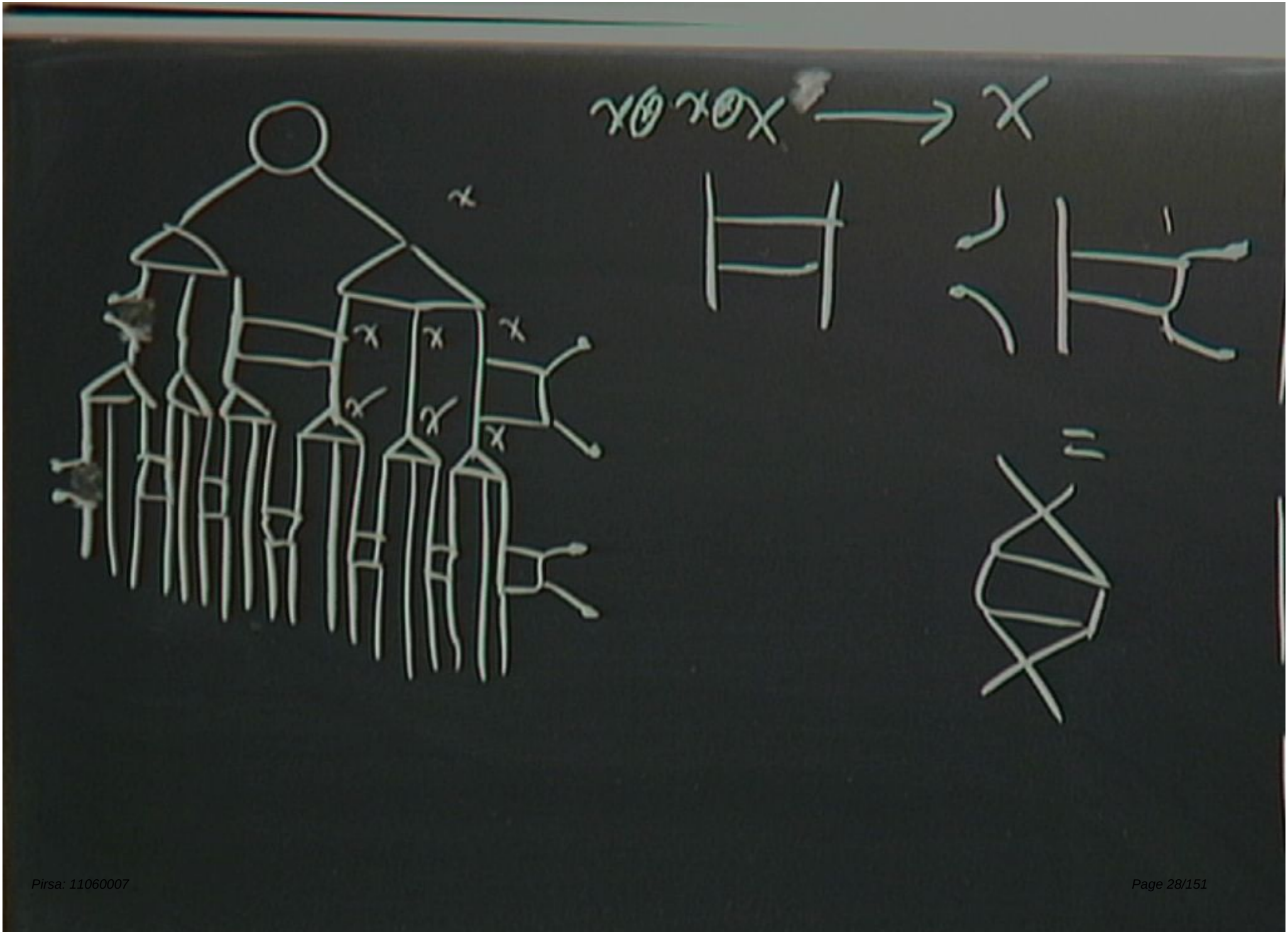
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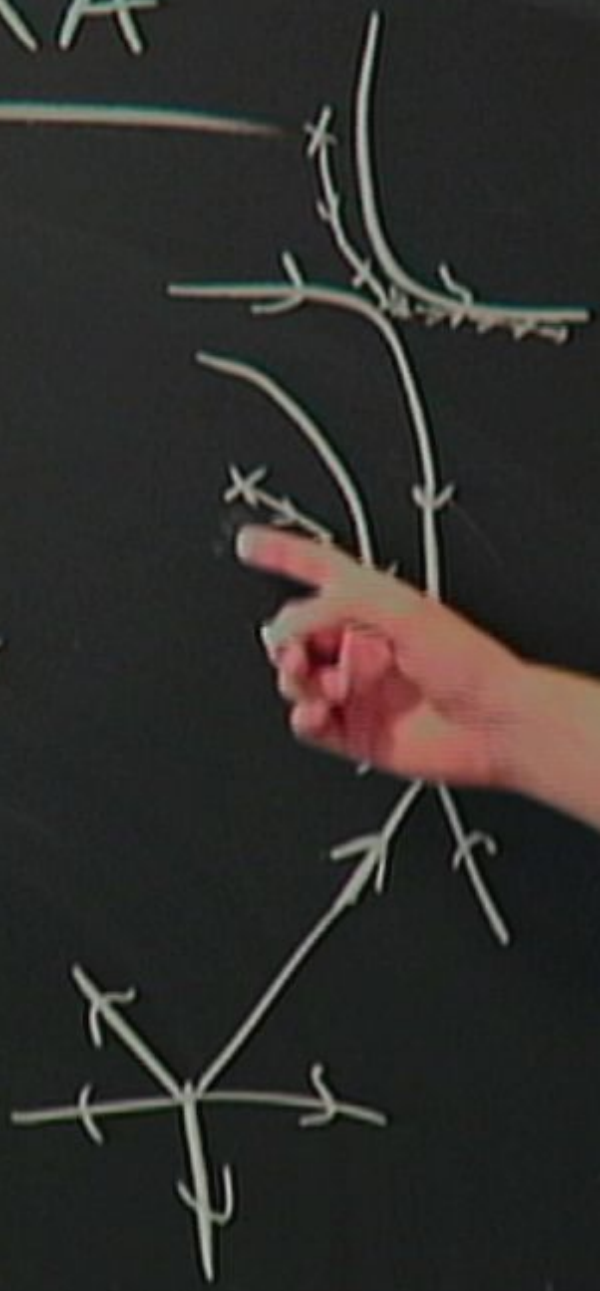

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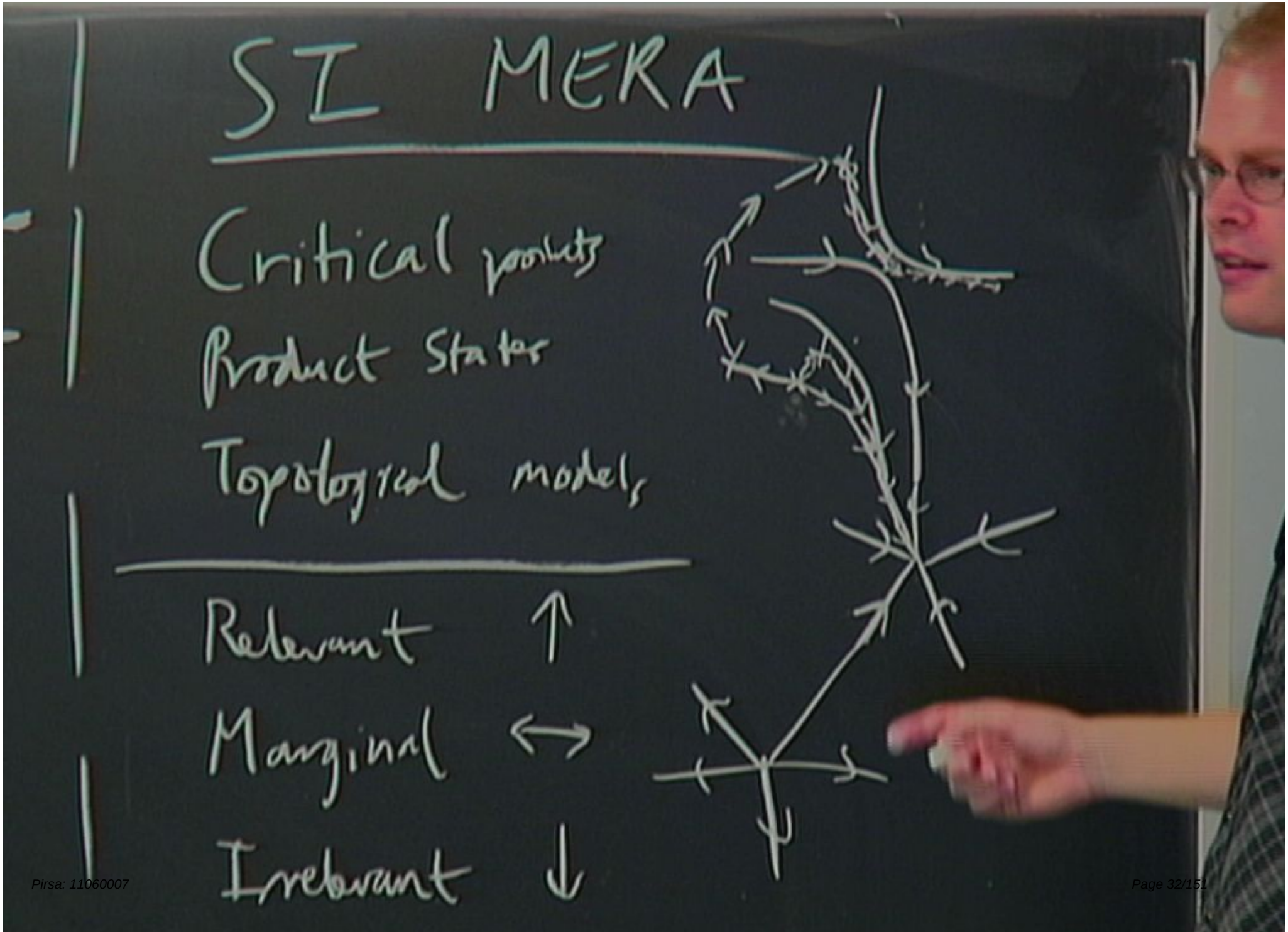
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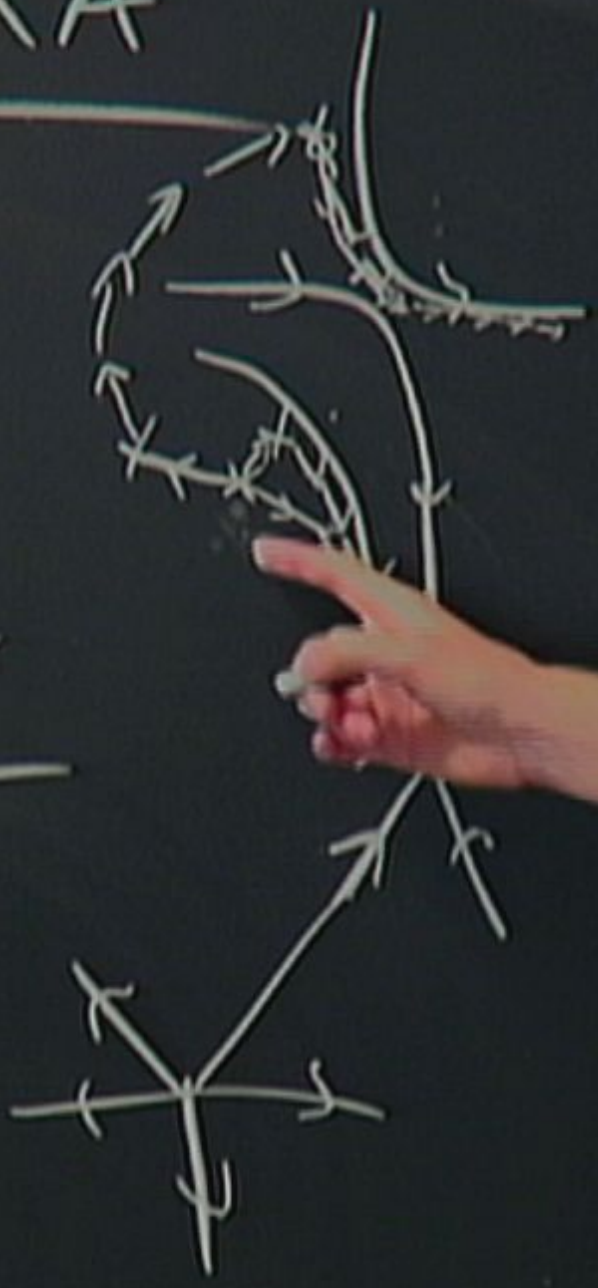

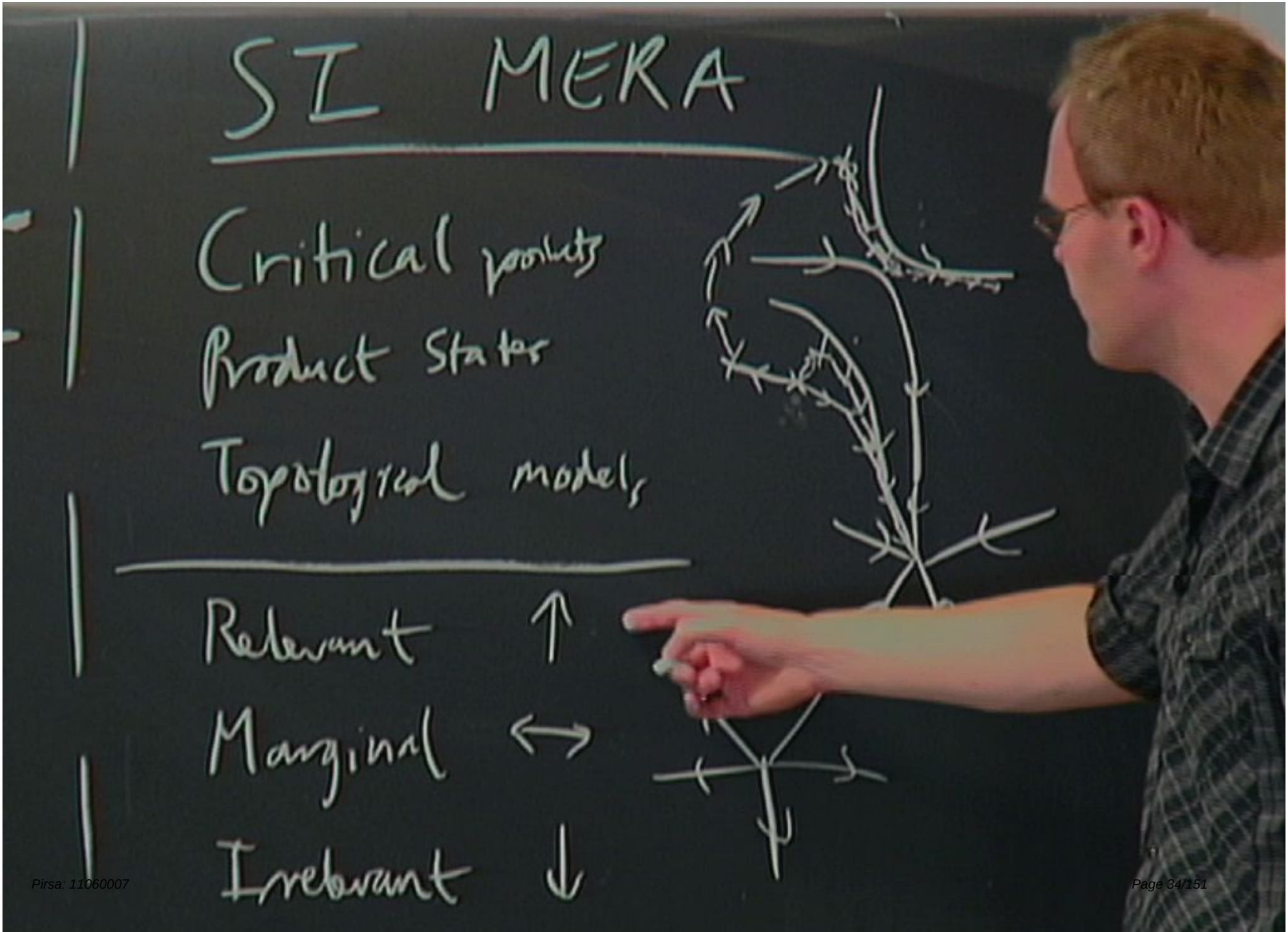
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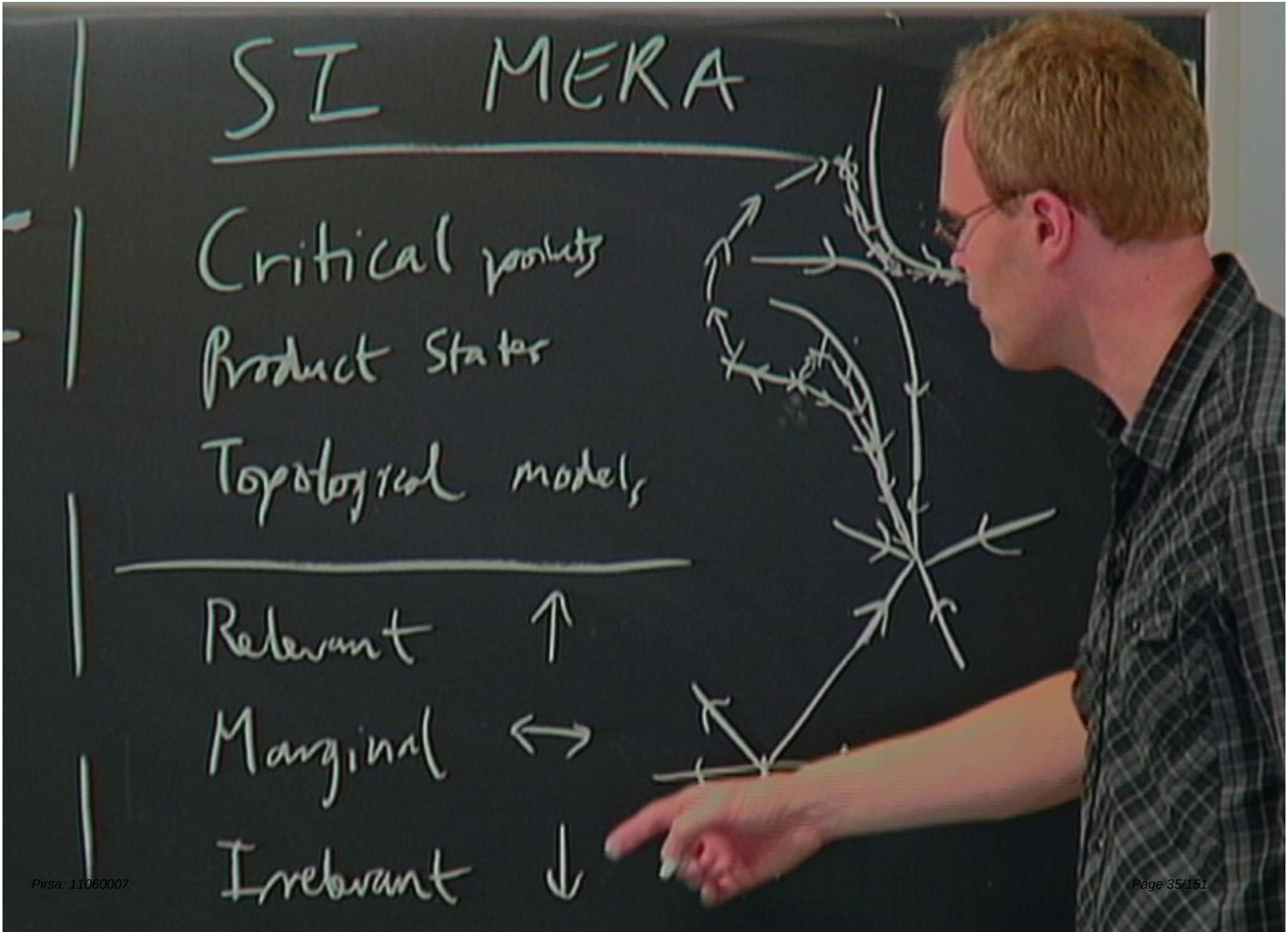
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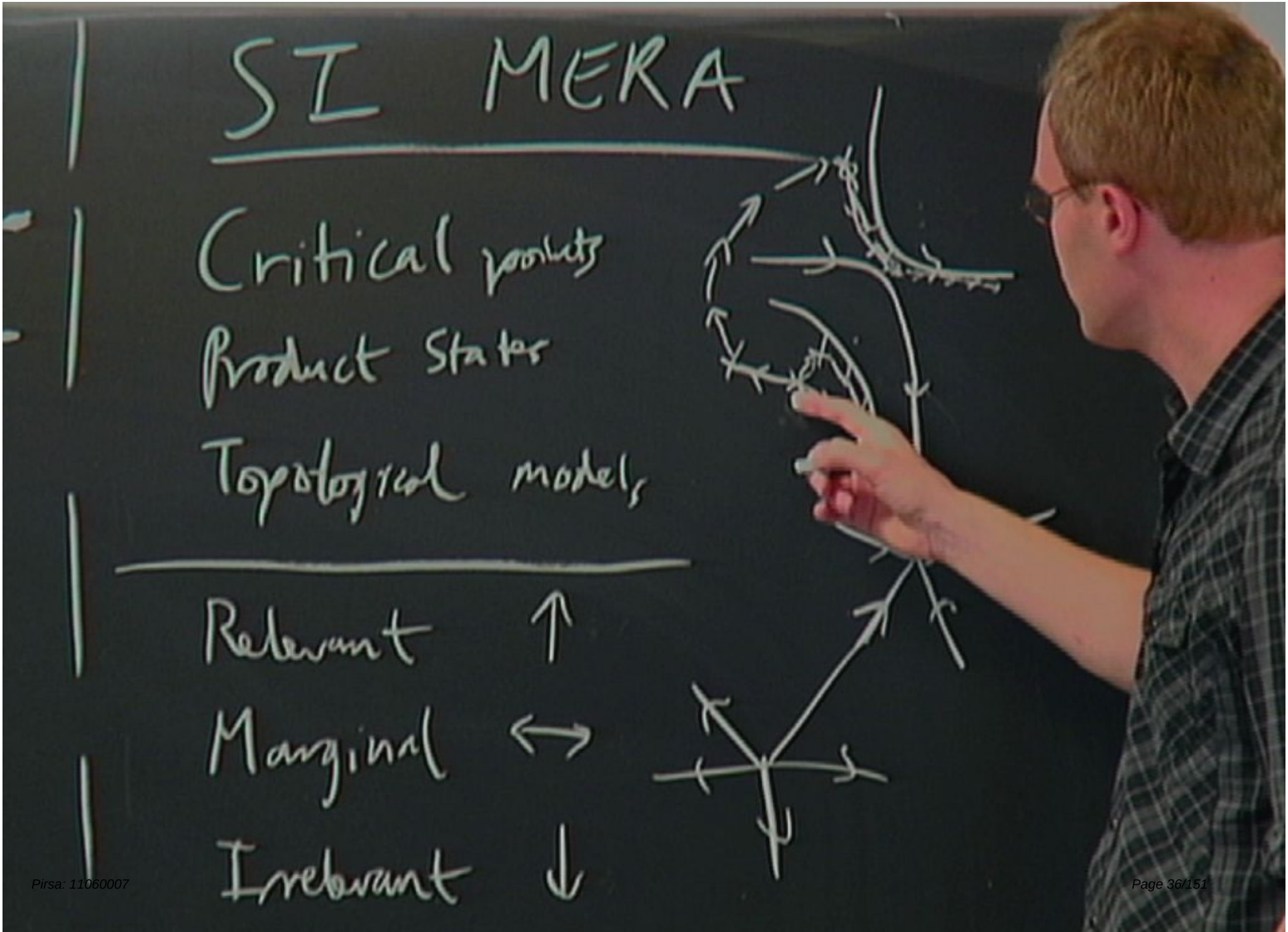
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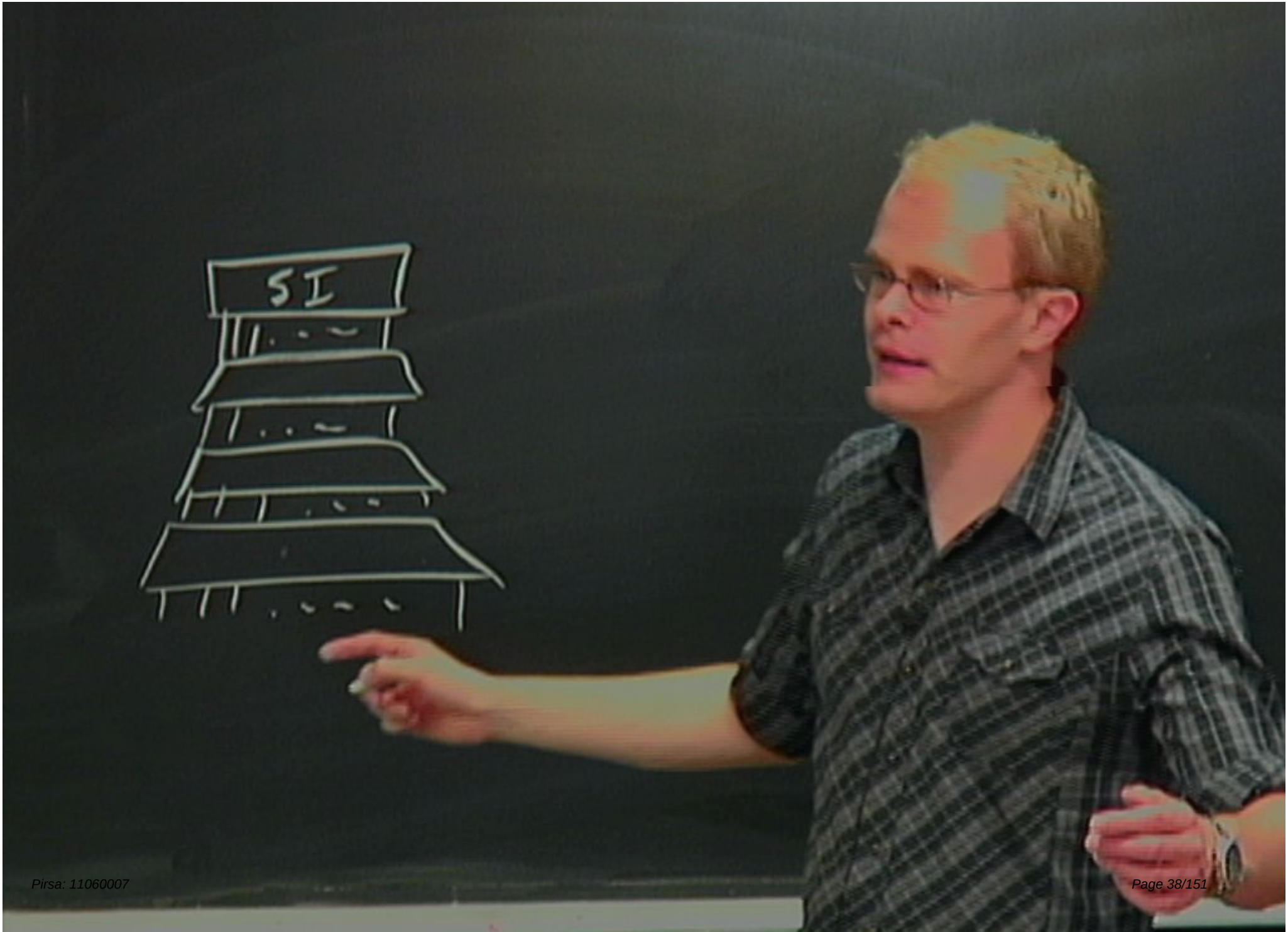
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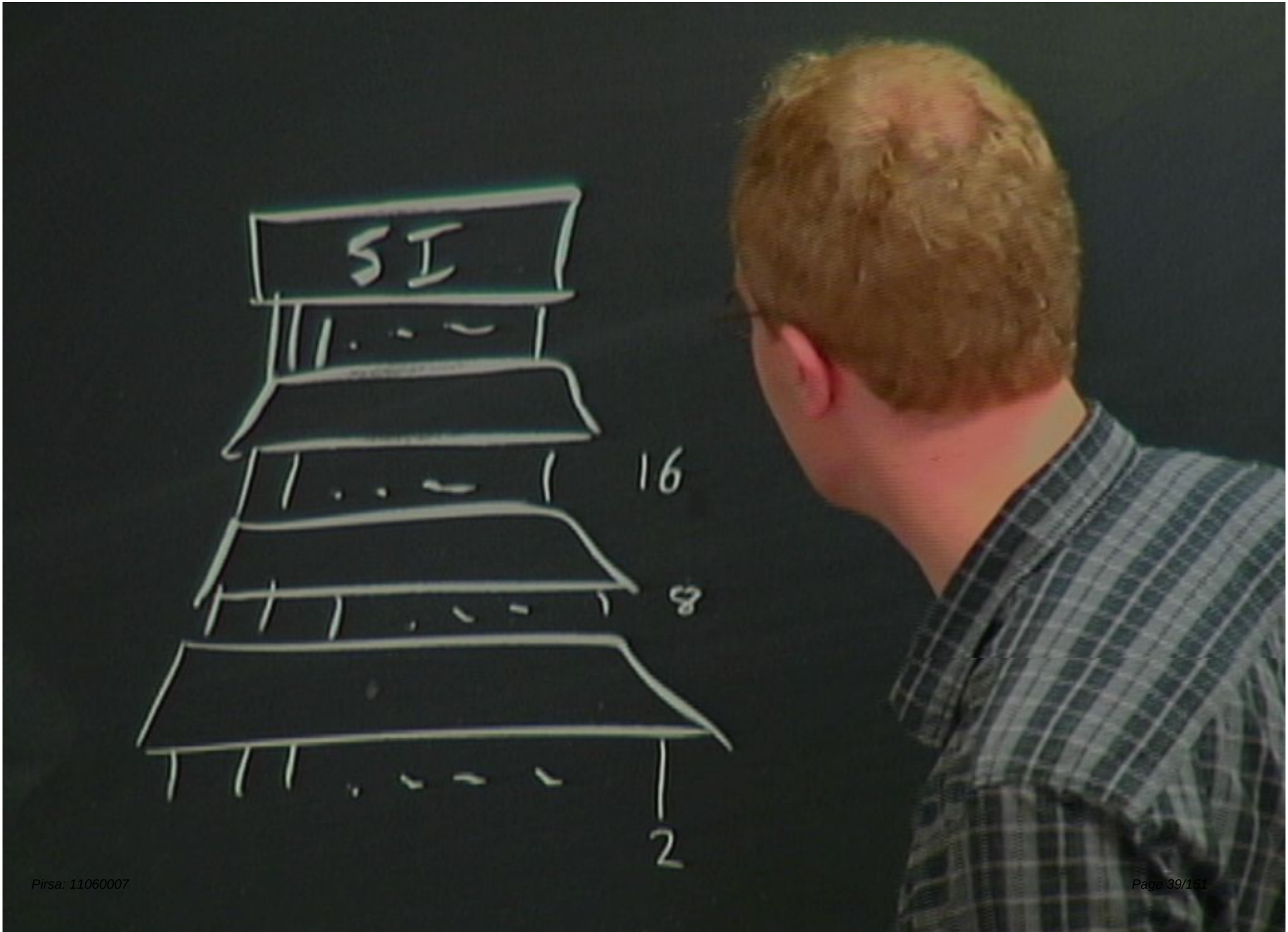
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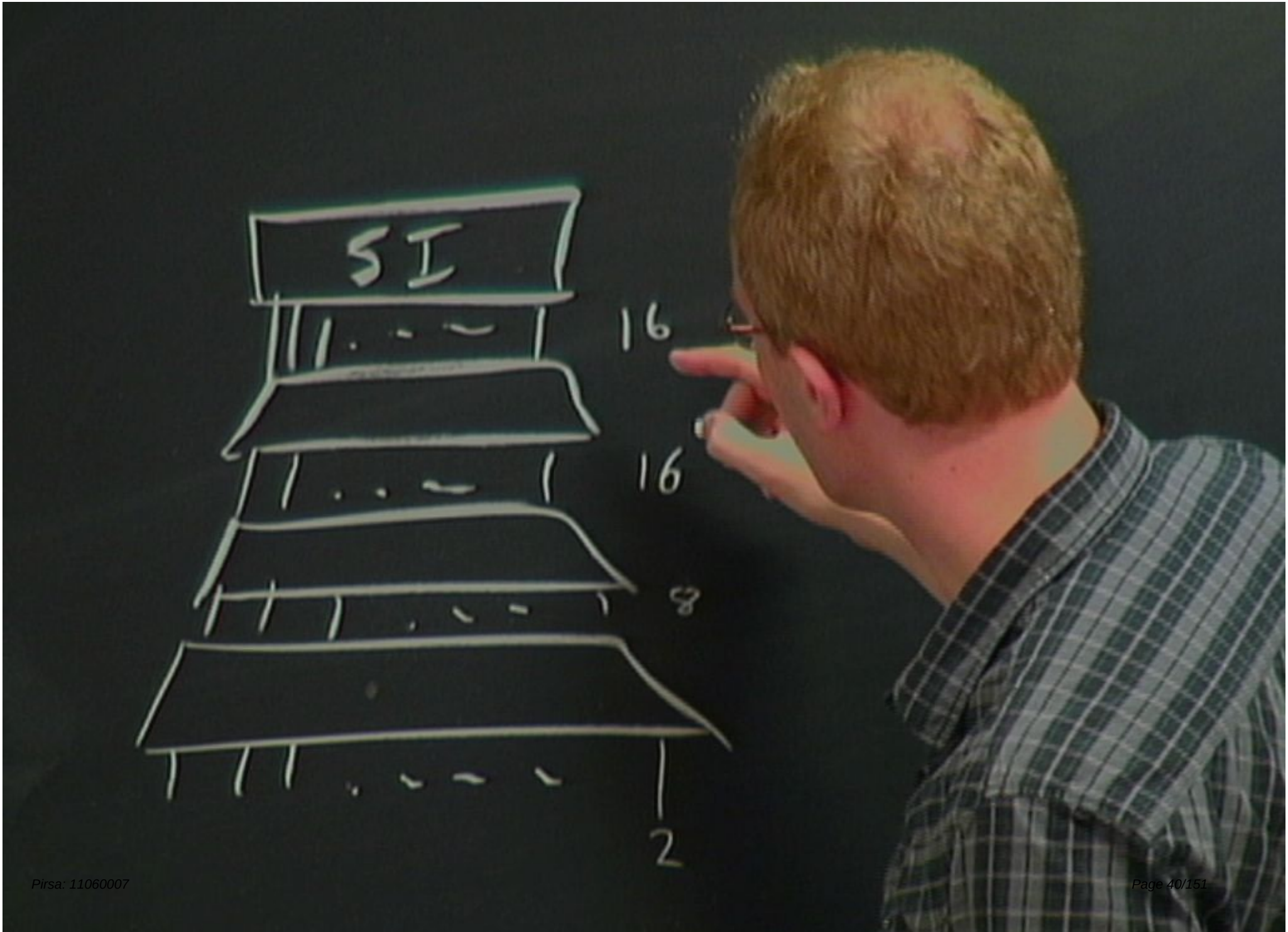
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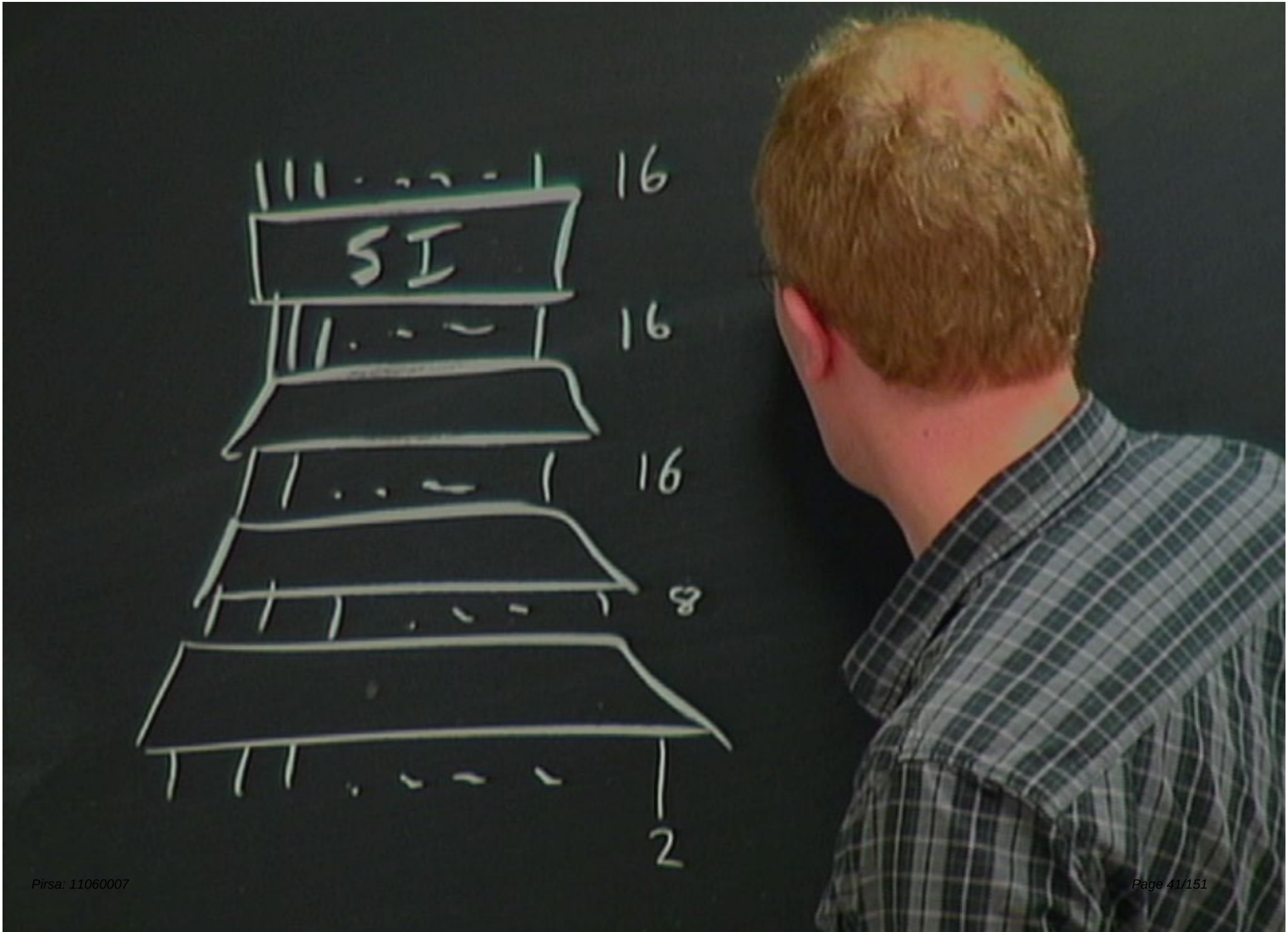
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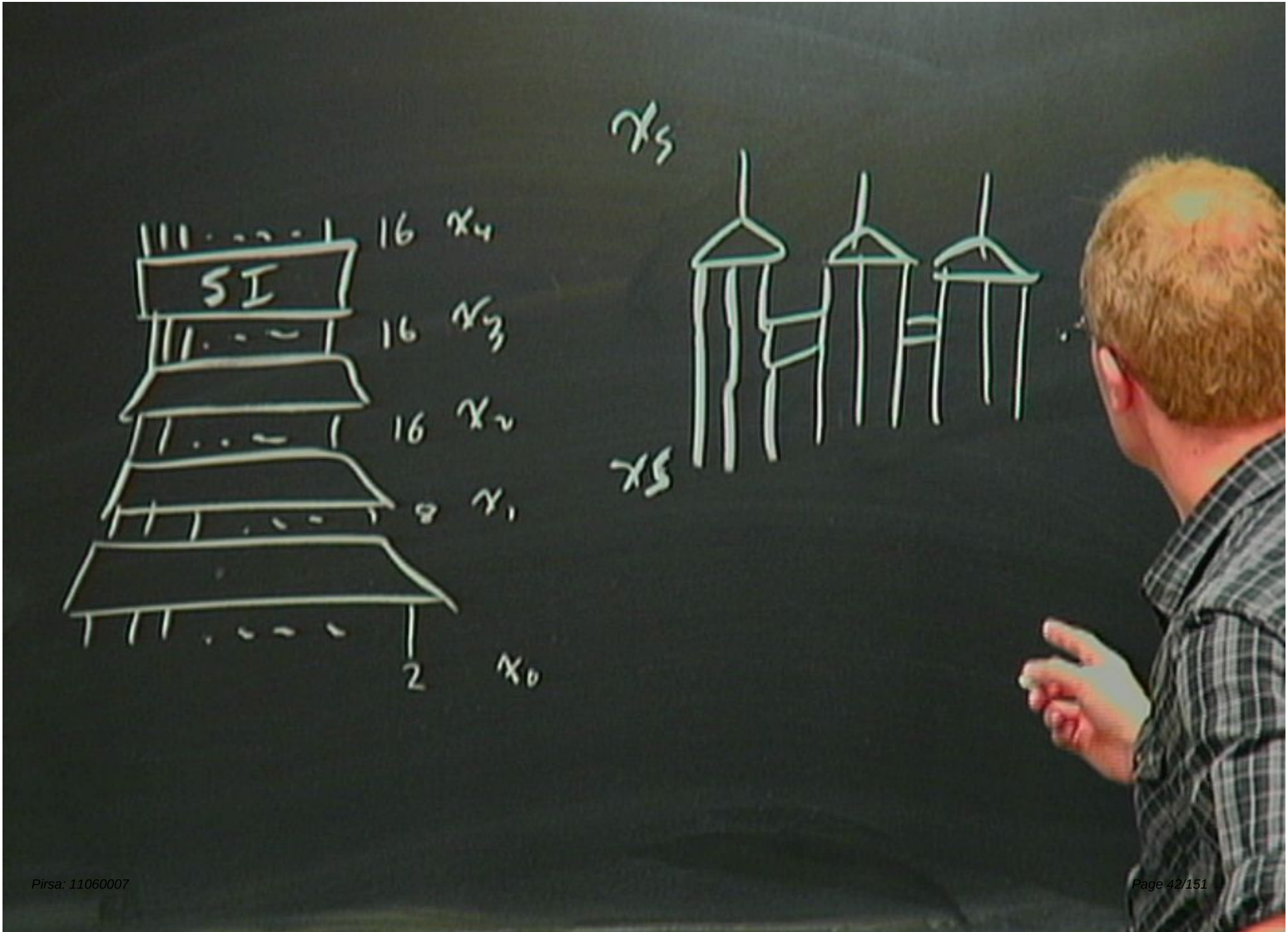
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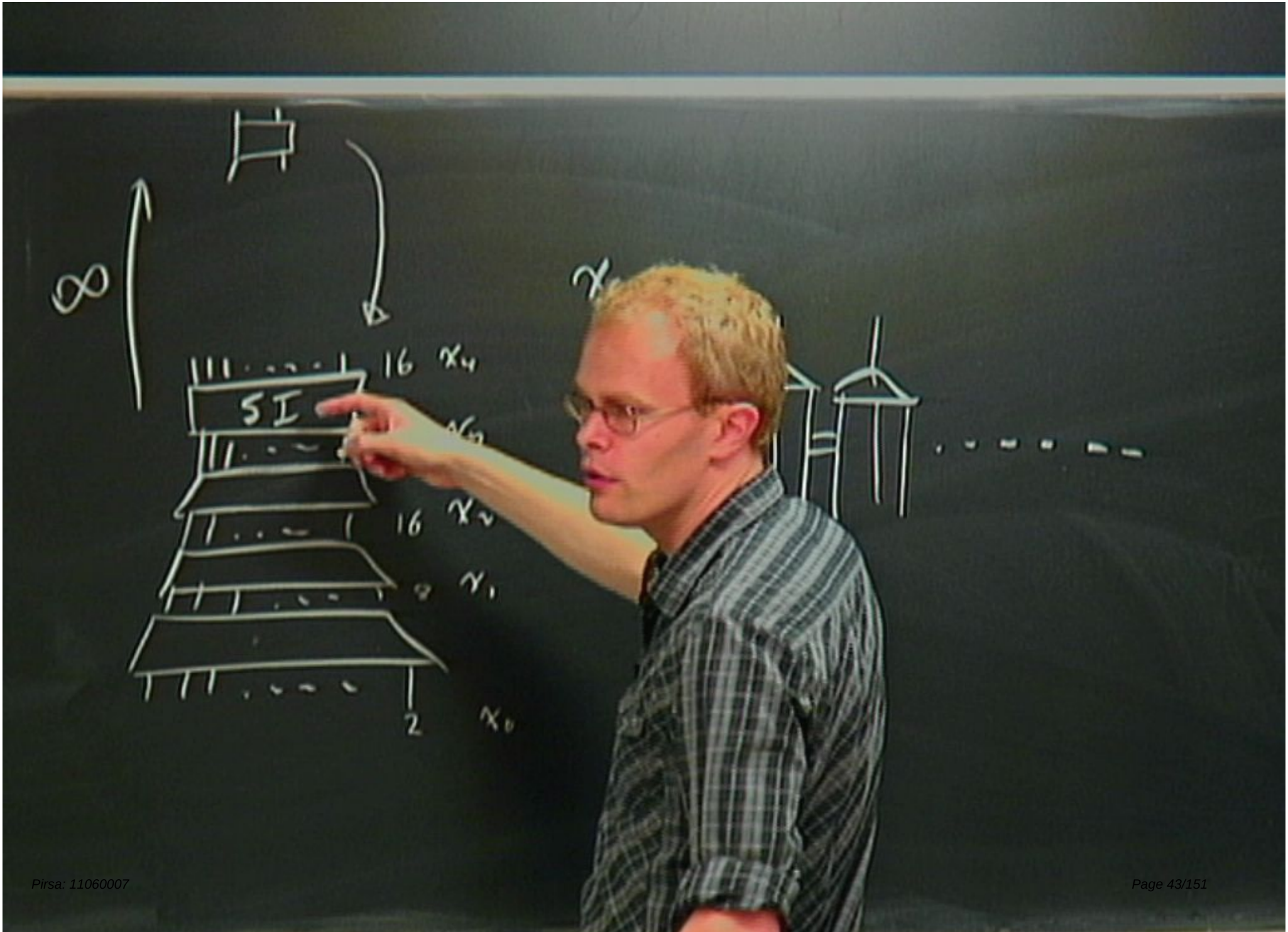
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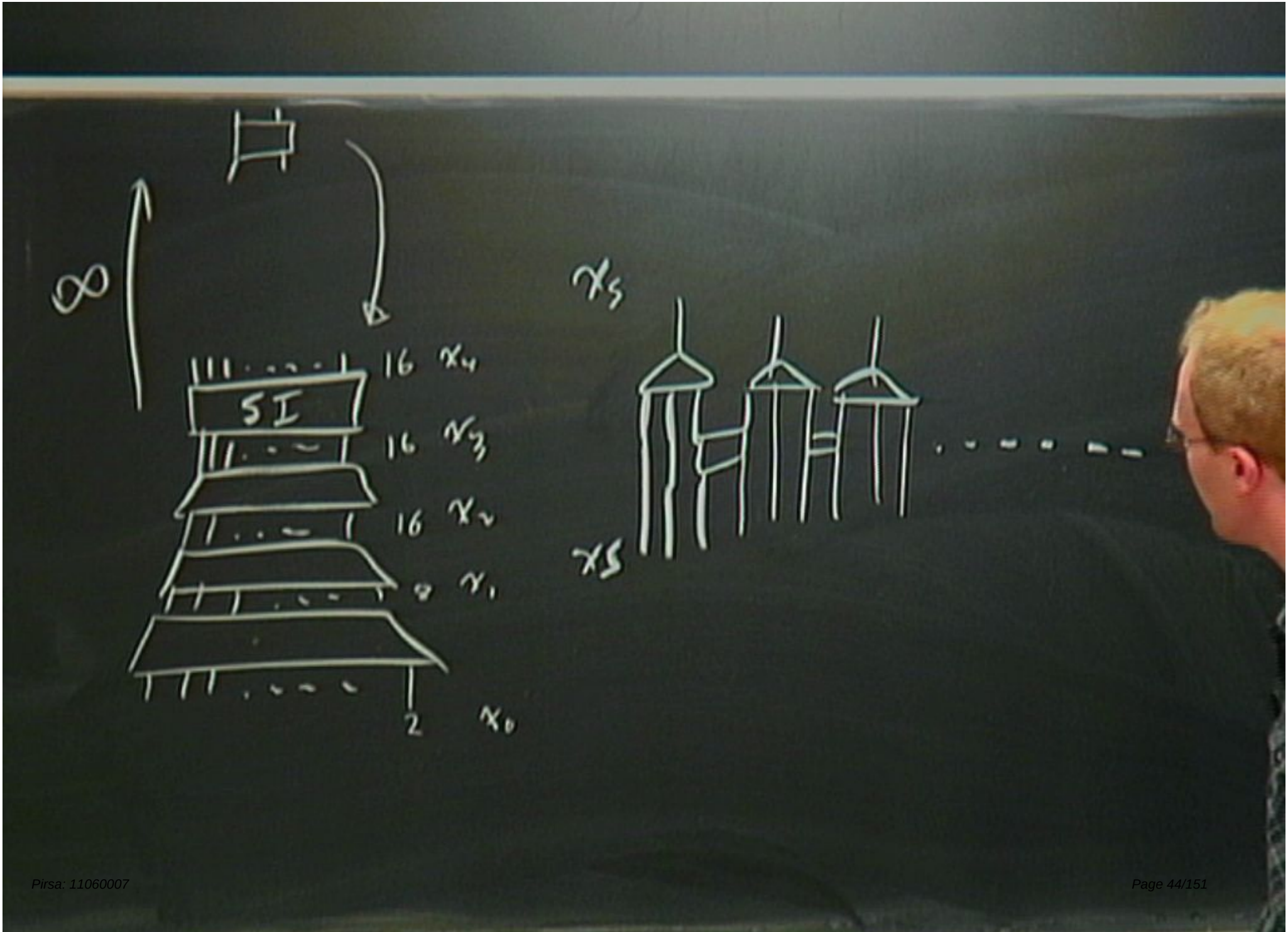
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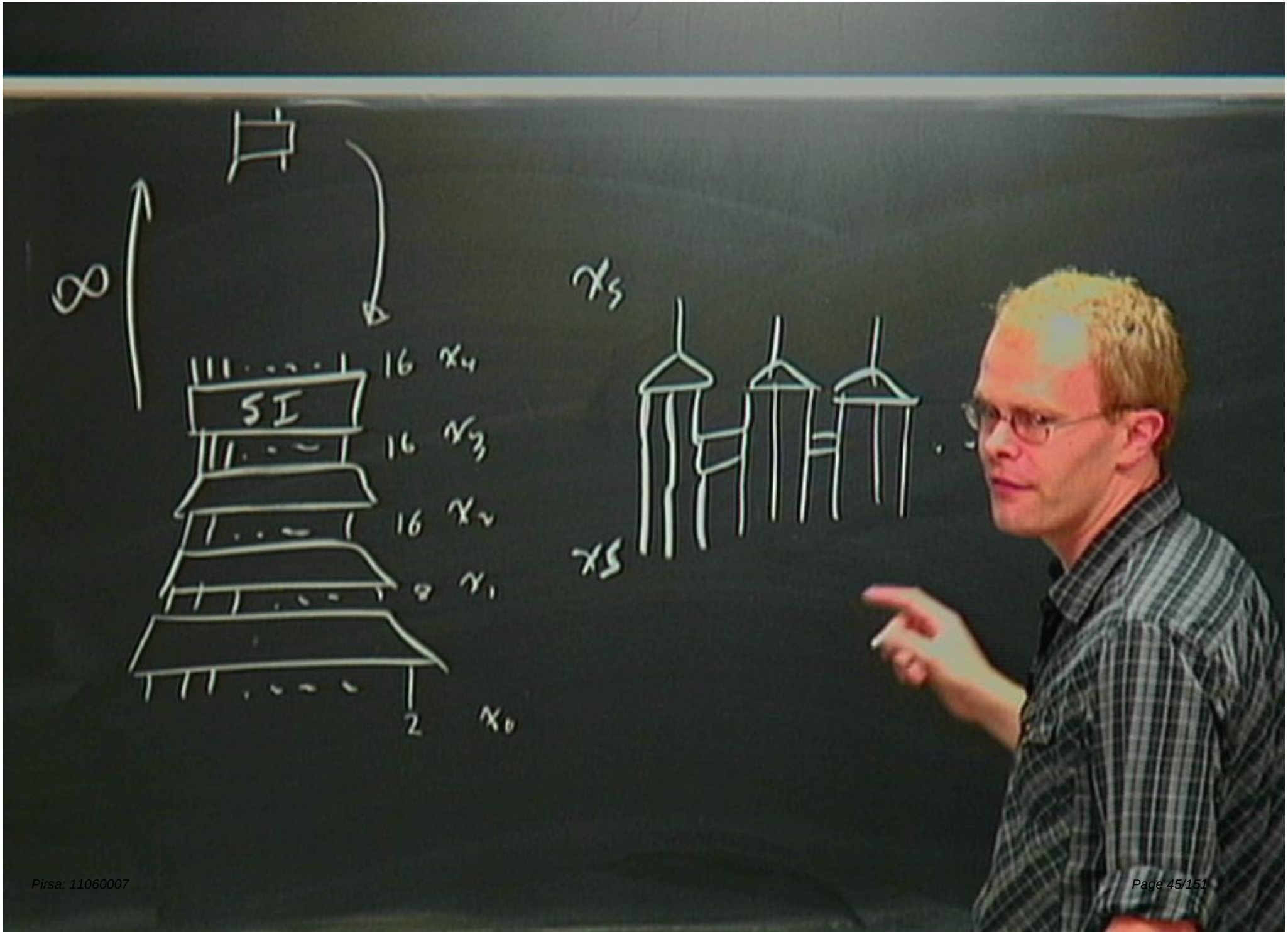
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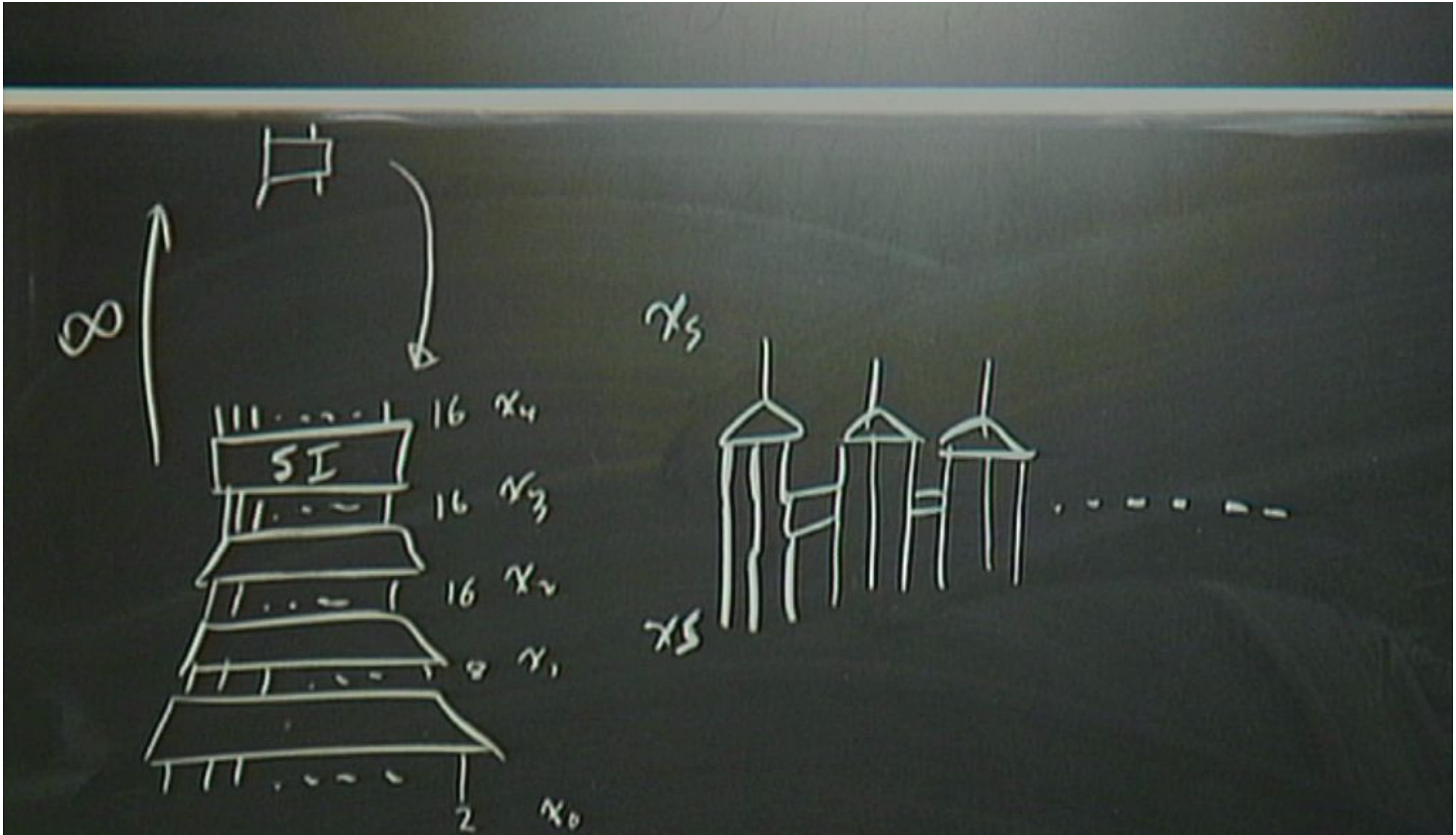
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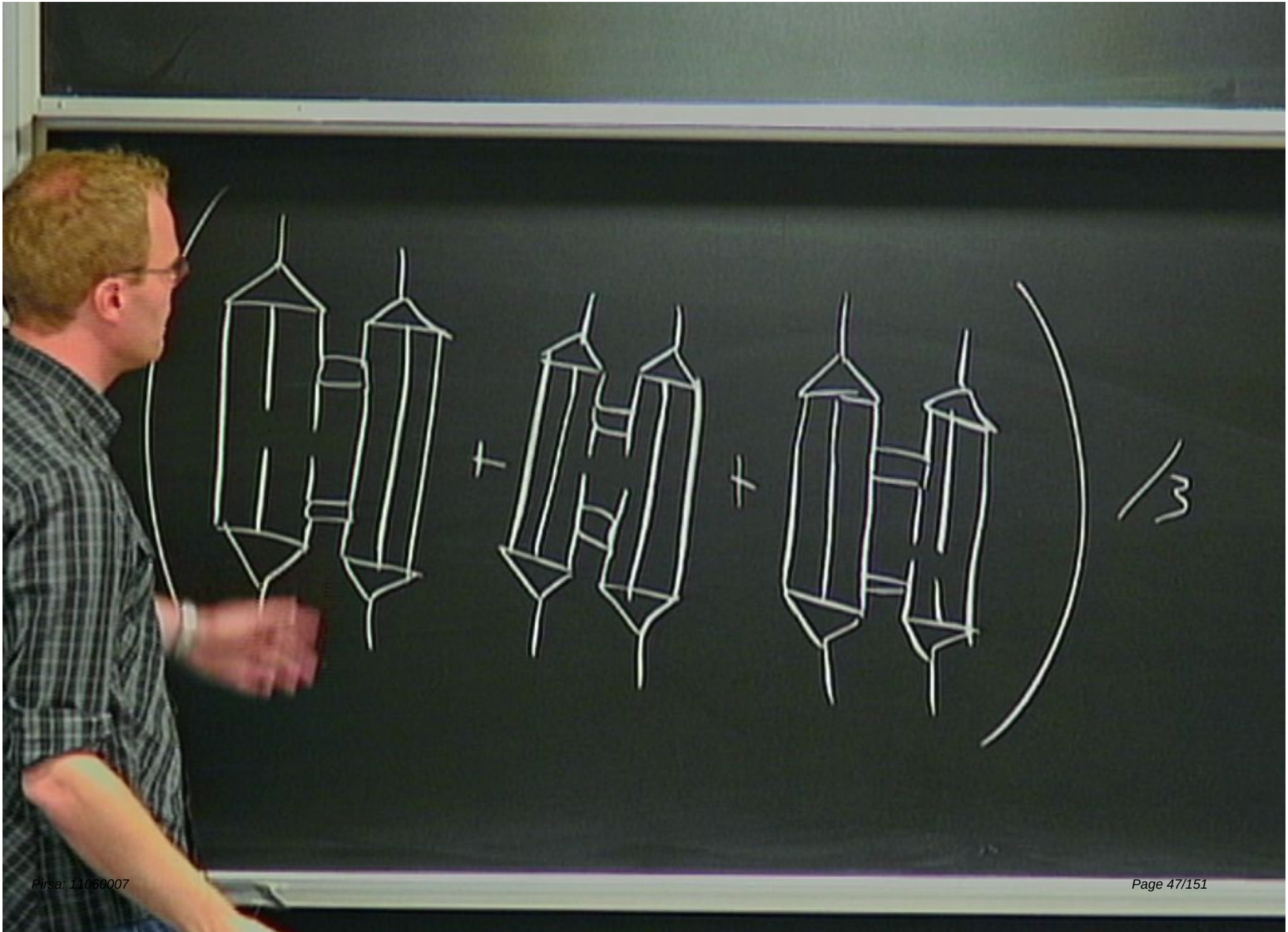

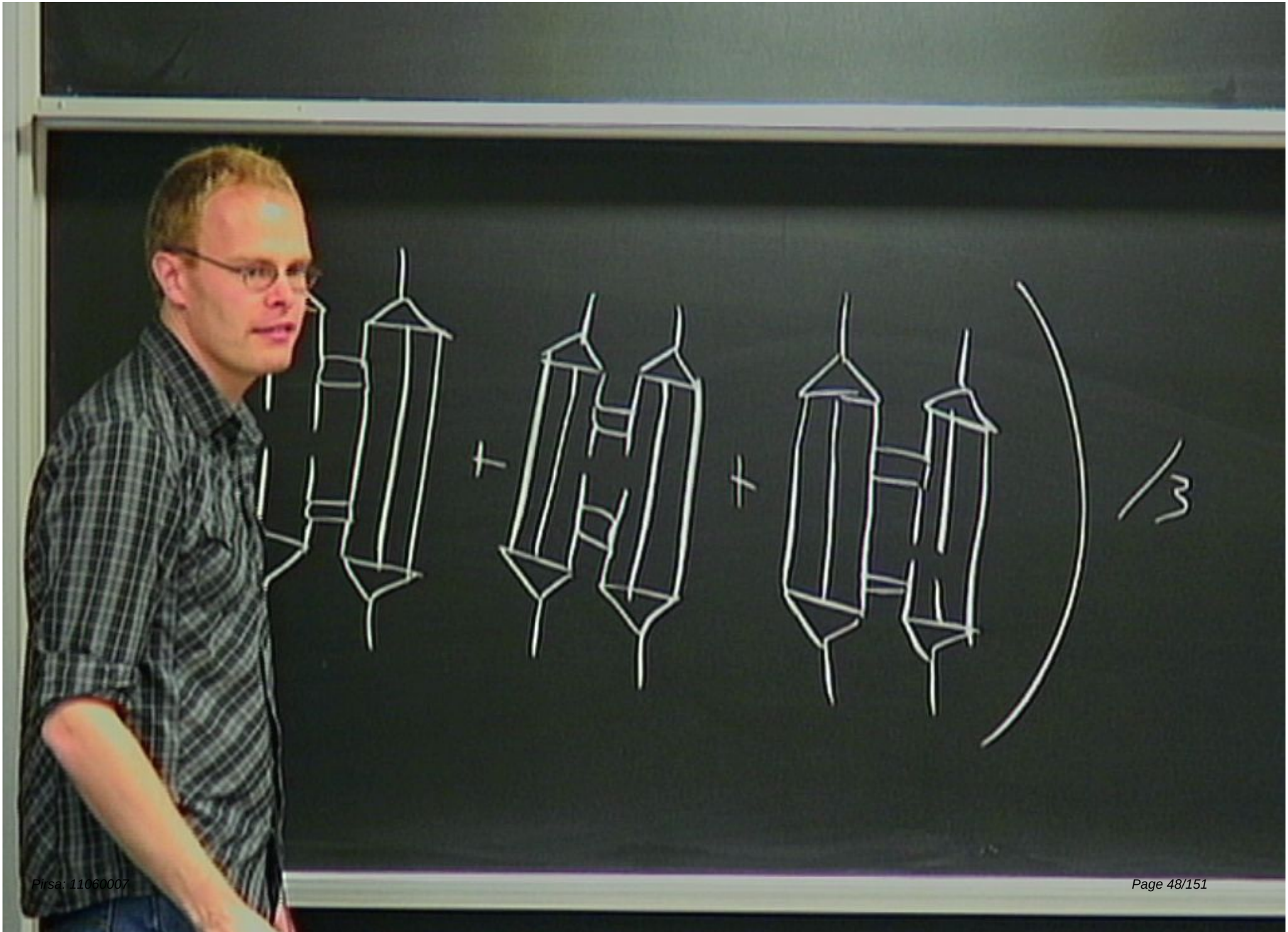

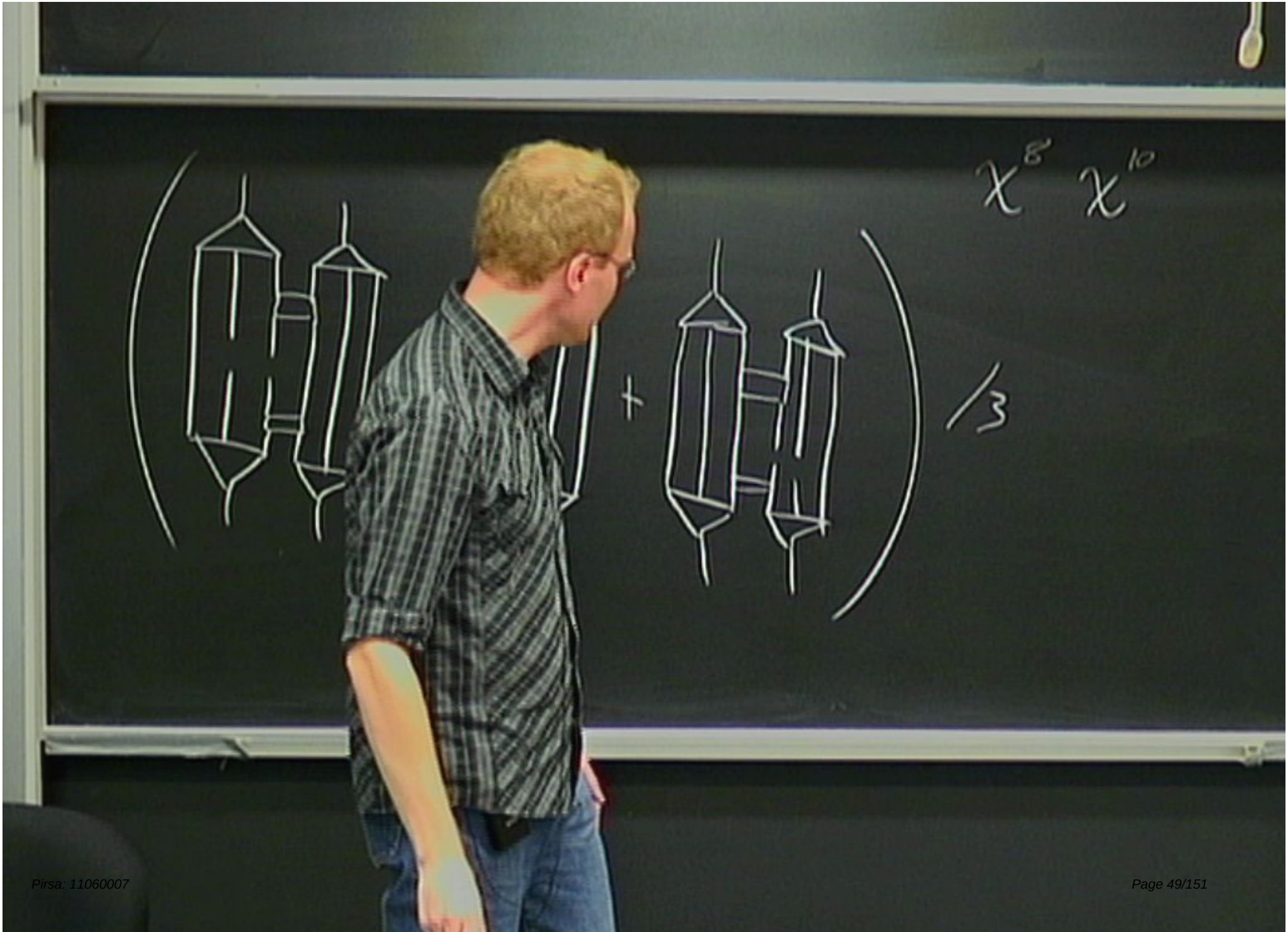
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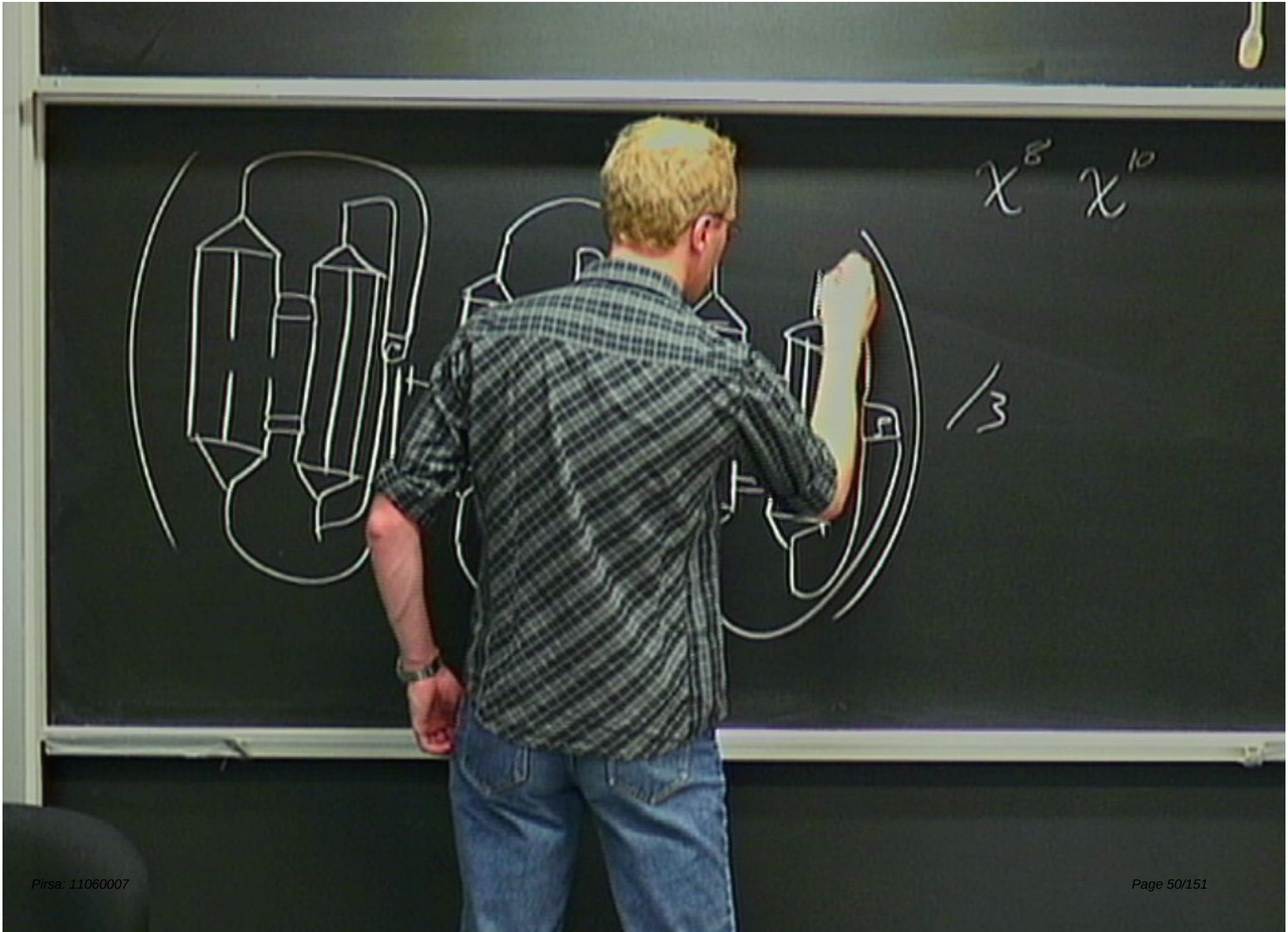
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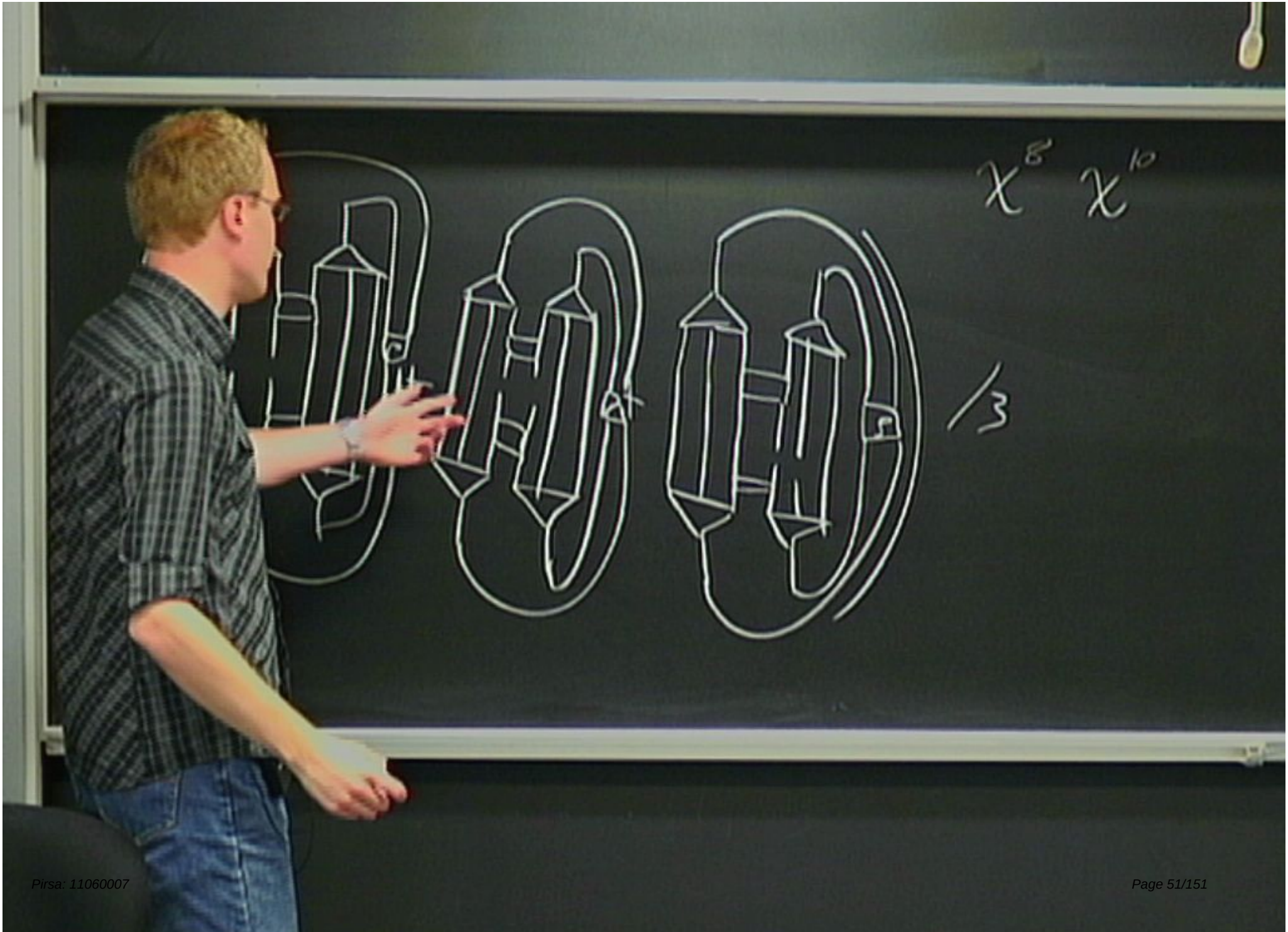
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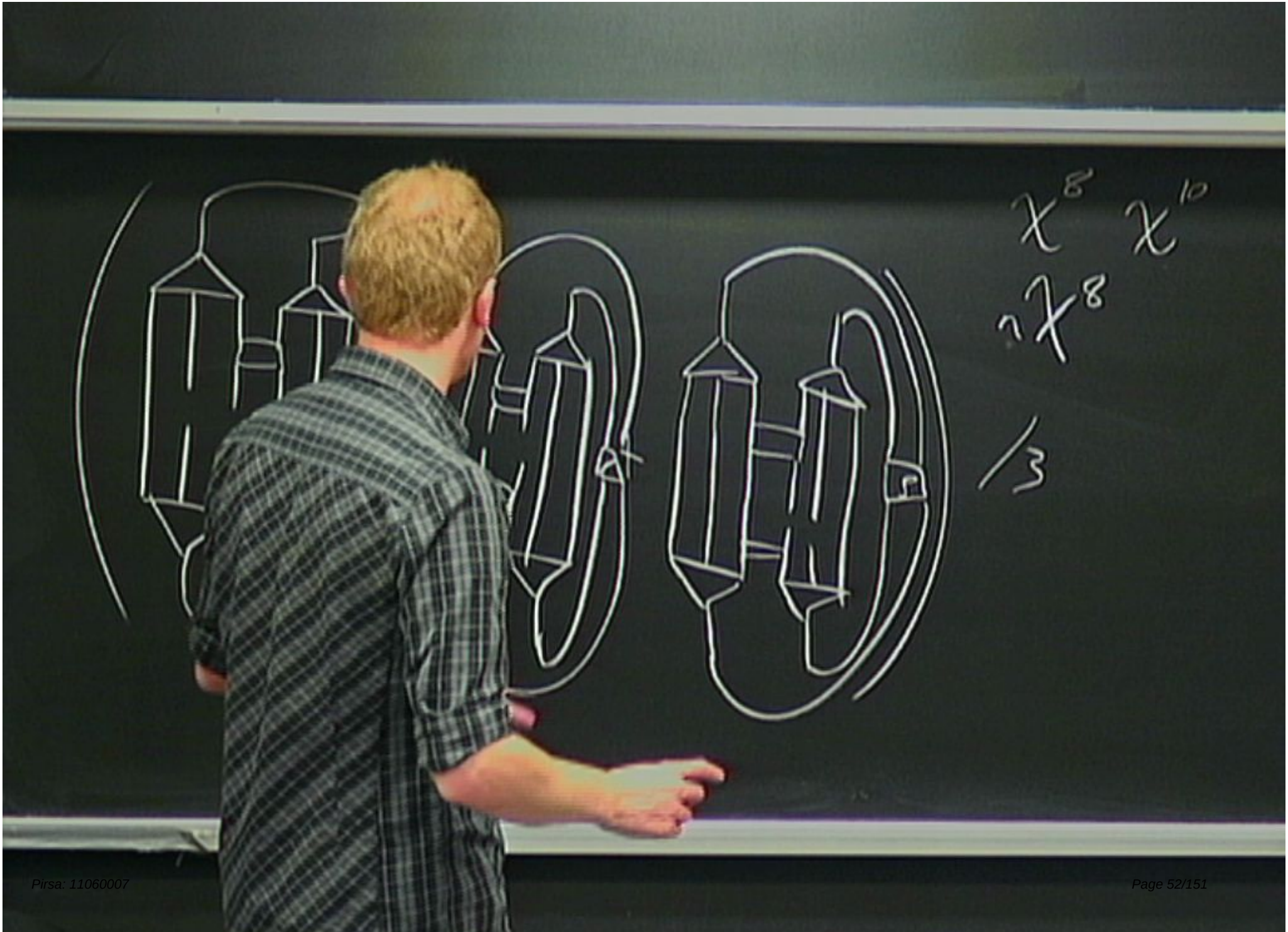
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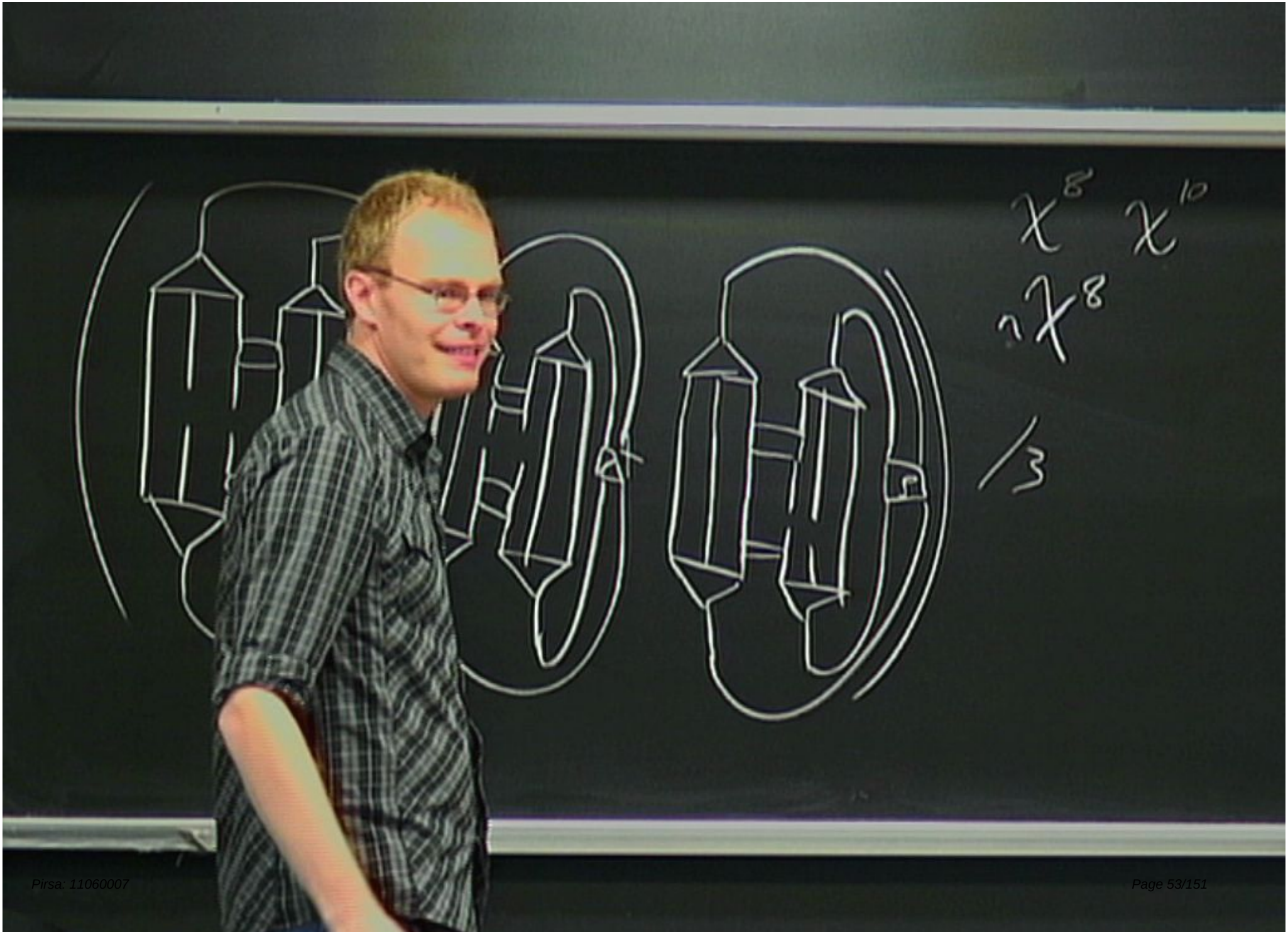
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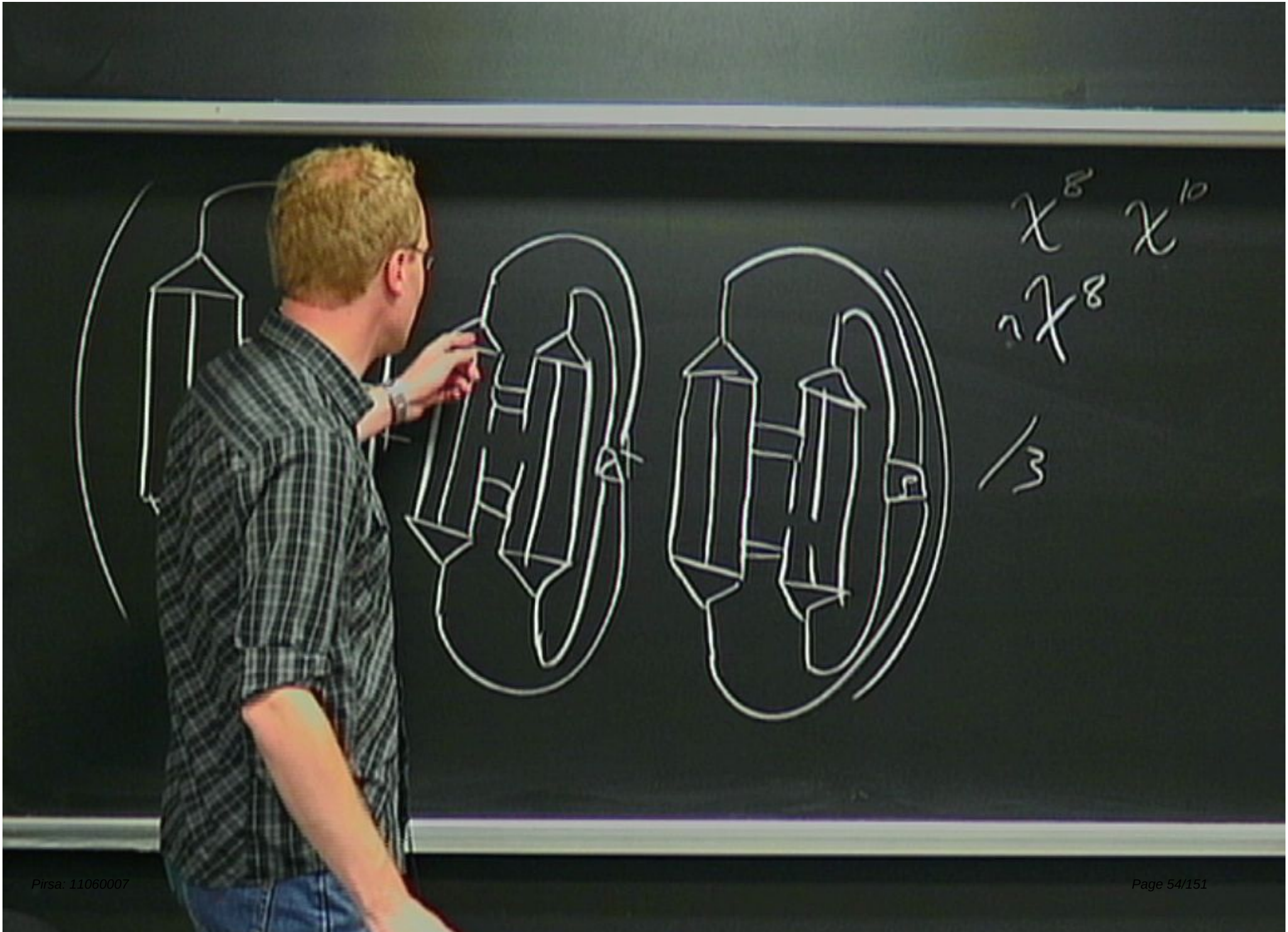
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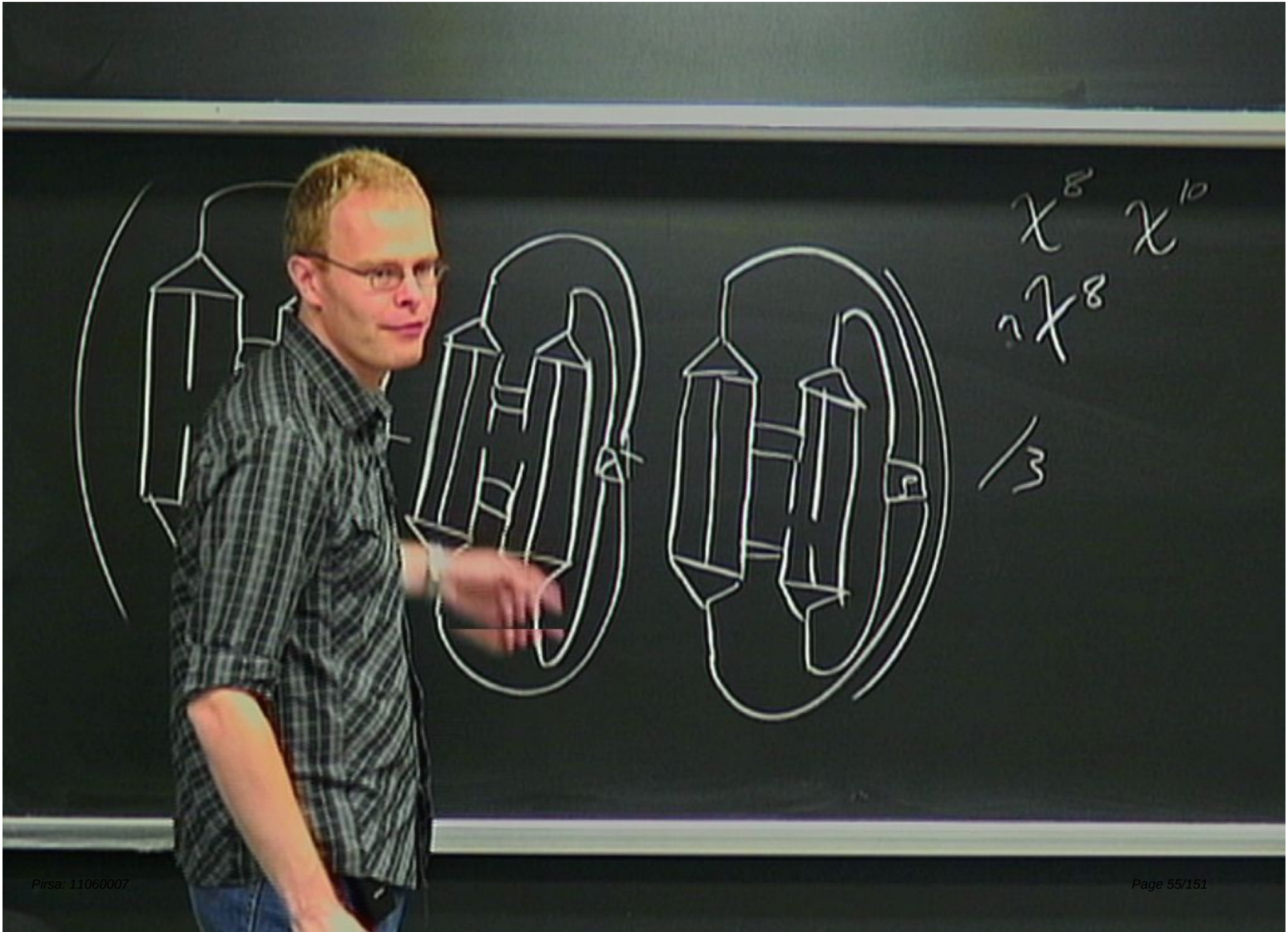
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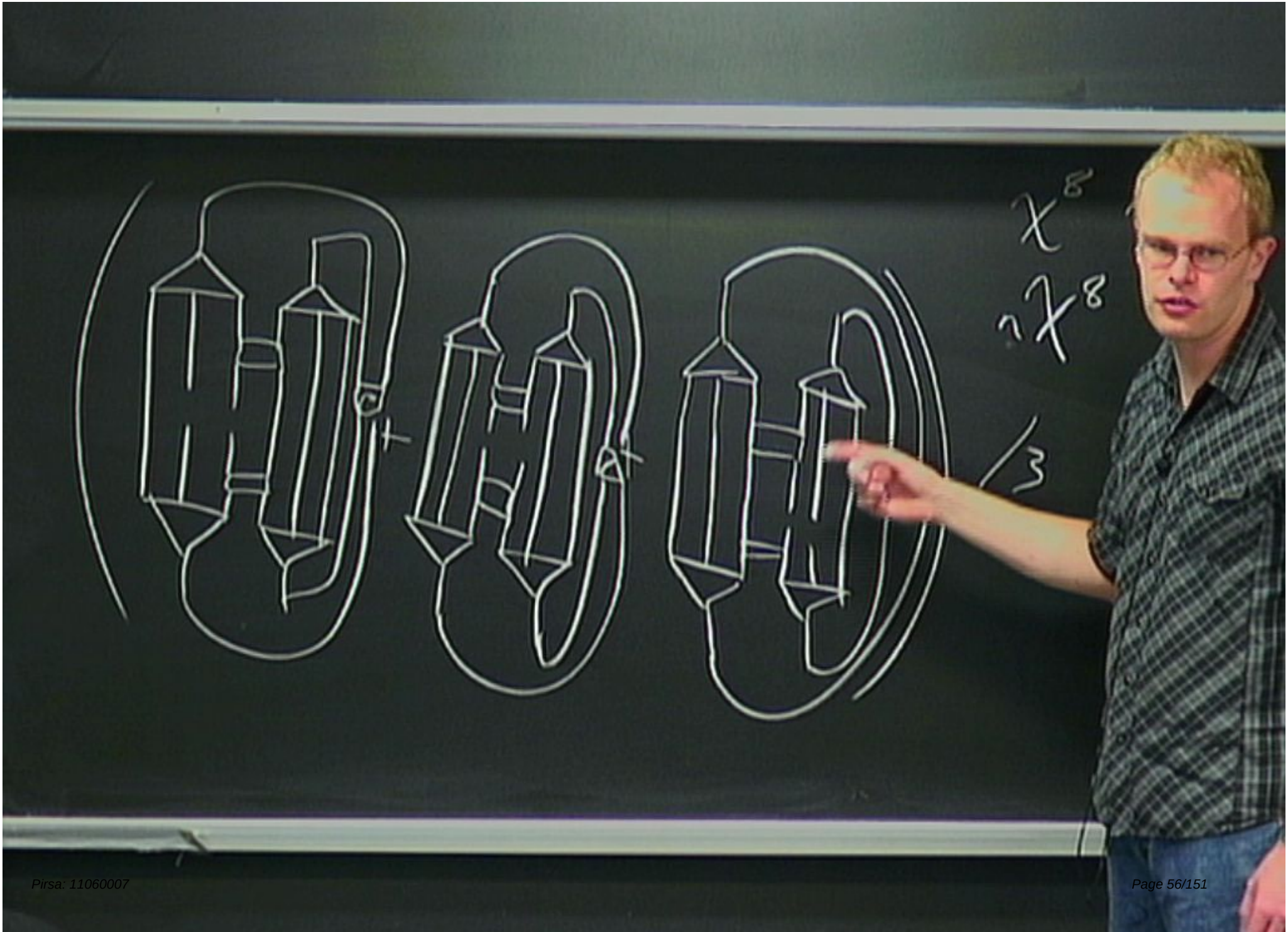
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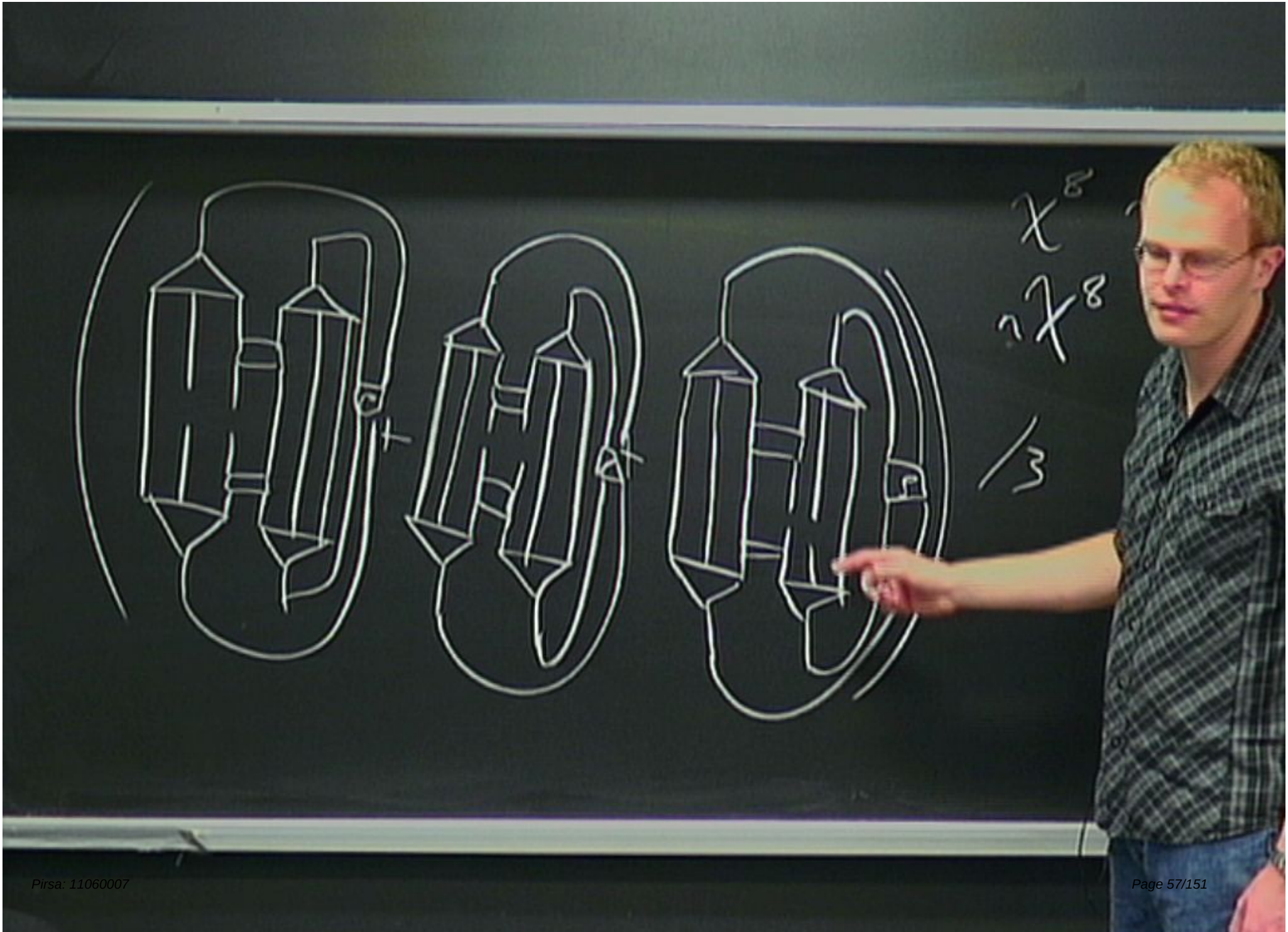
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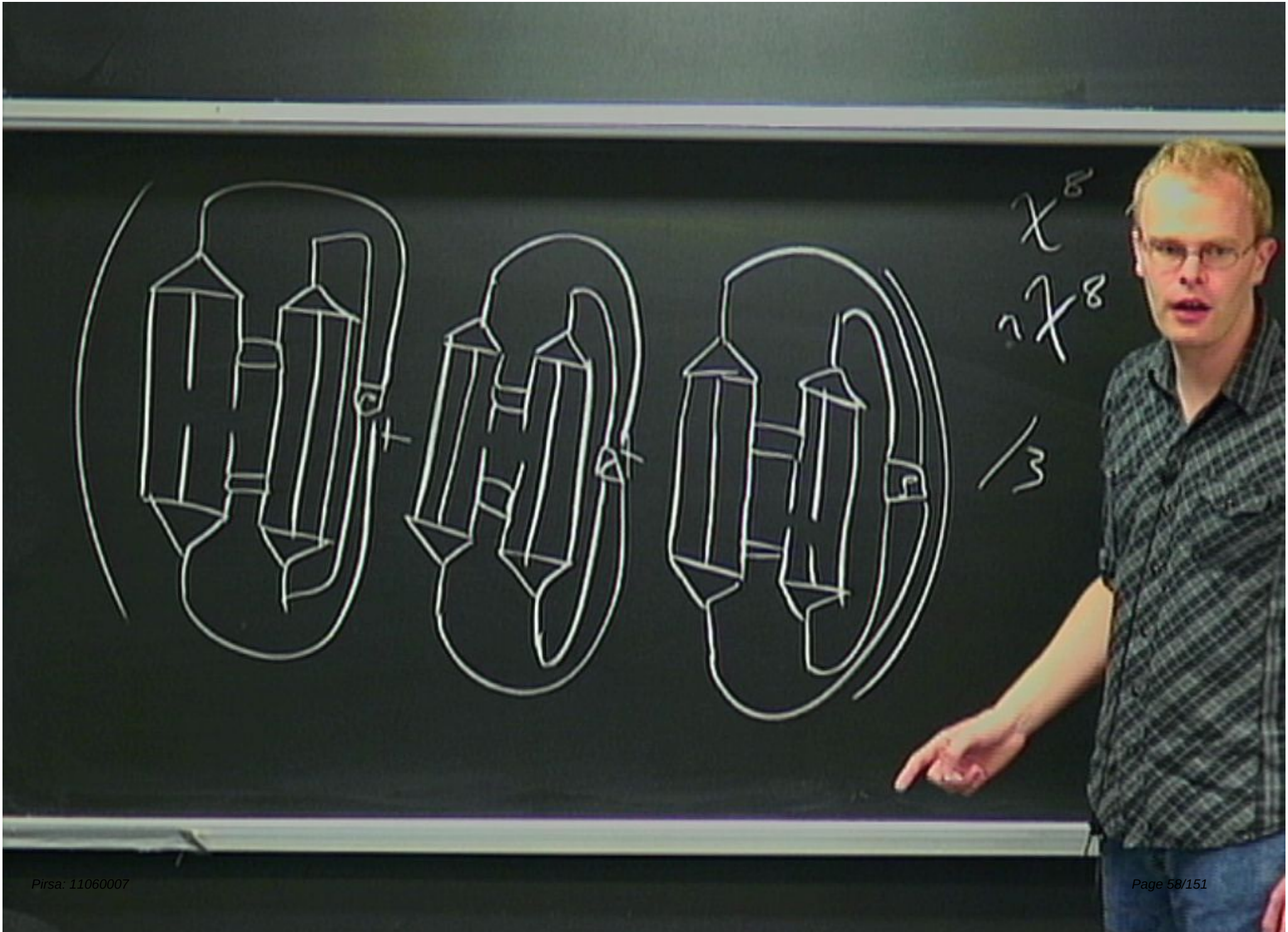
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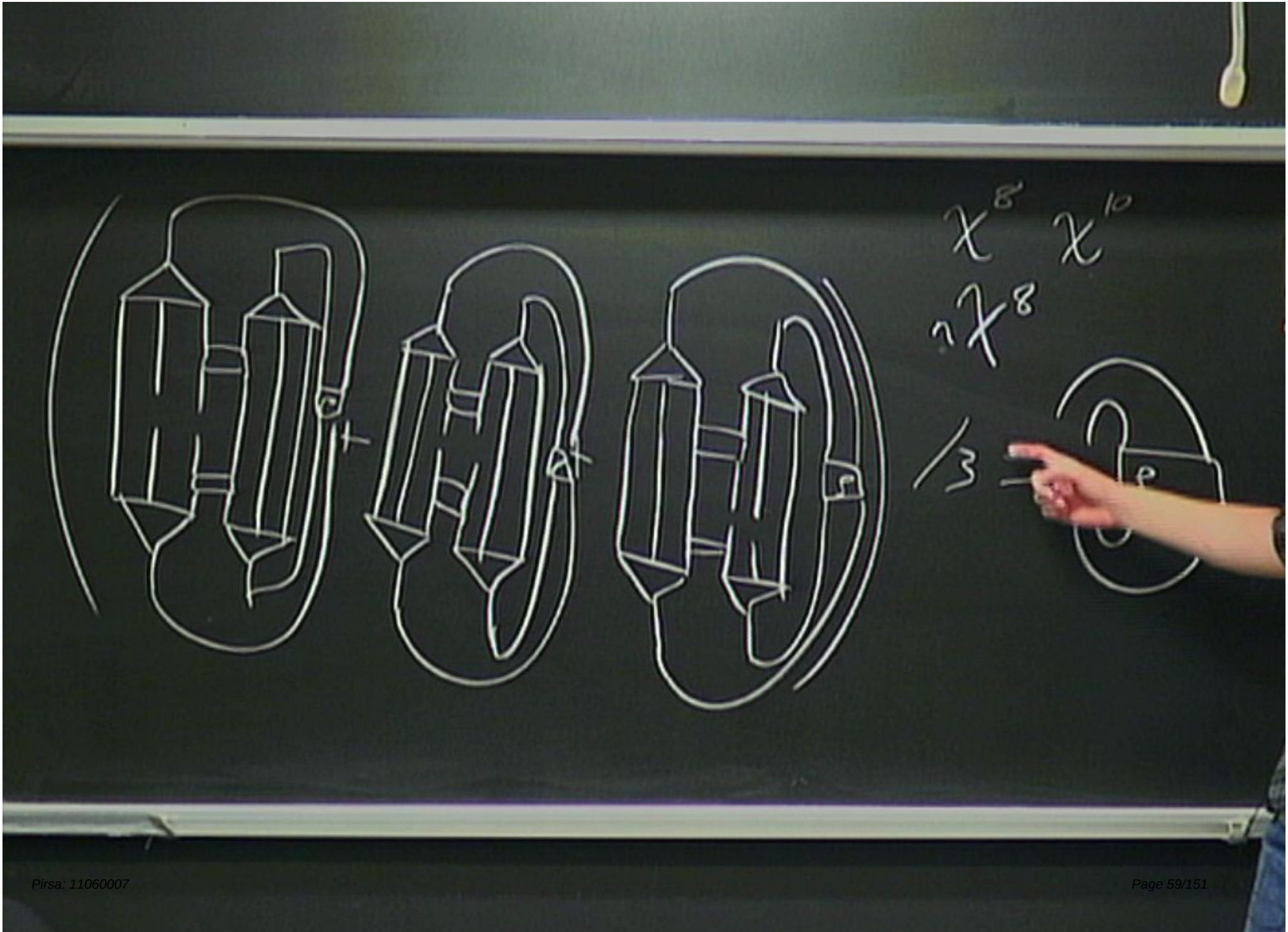
χ^8
χ^{10}
χ^8
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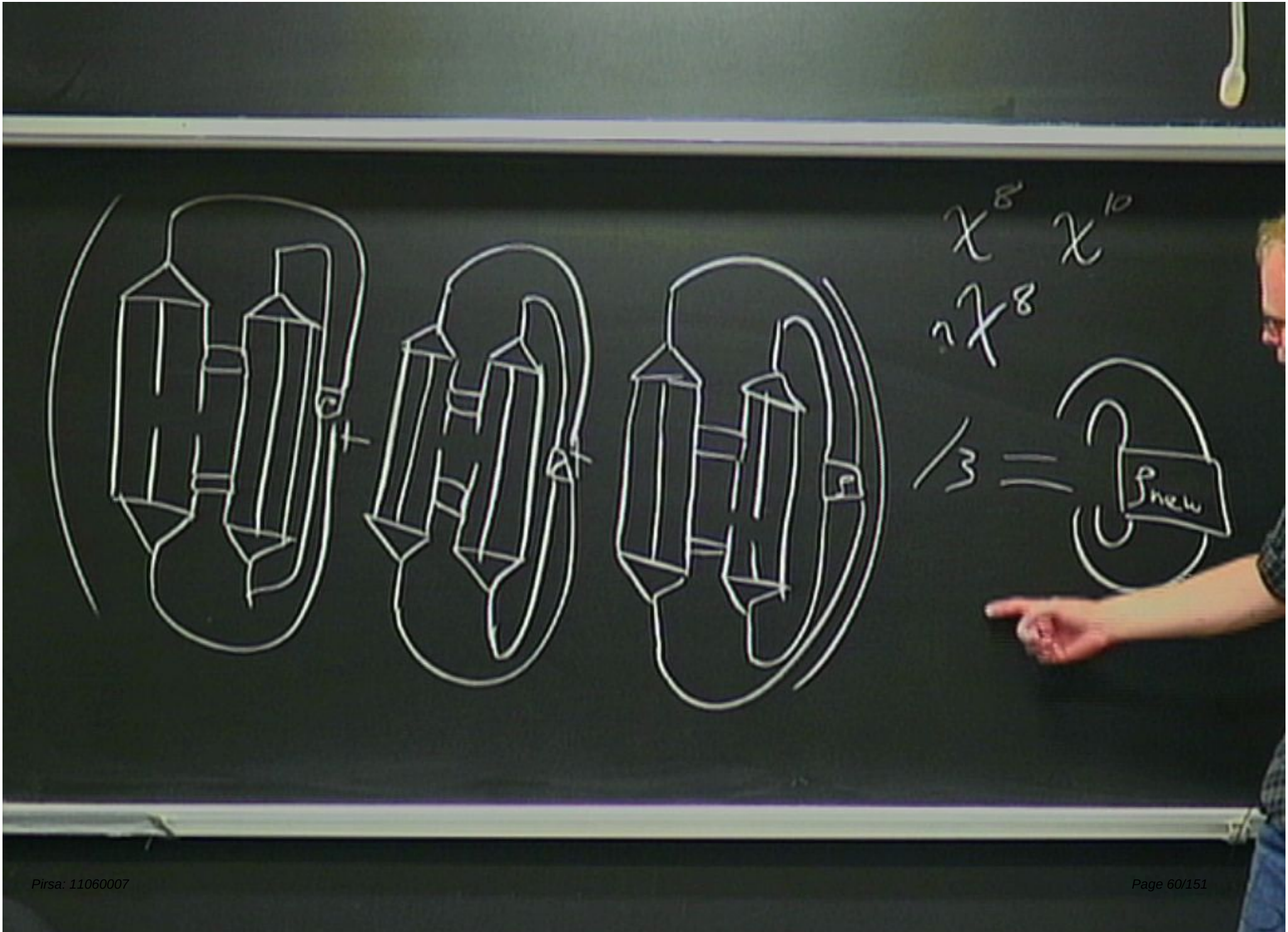
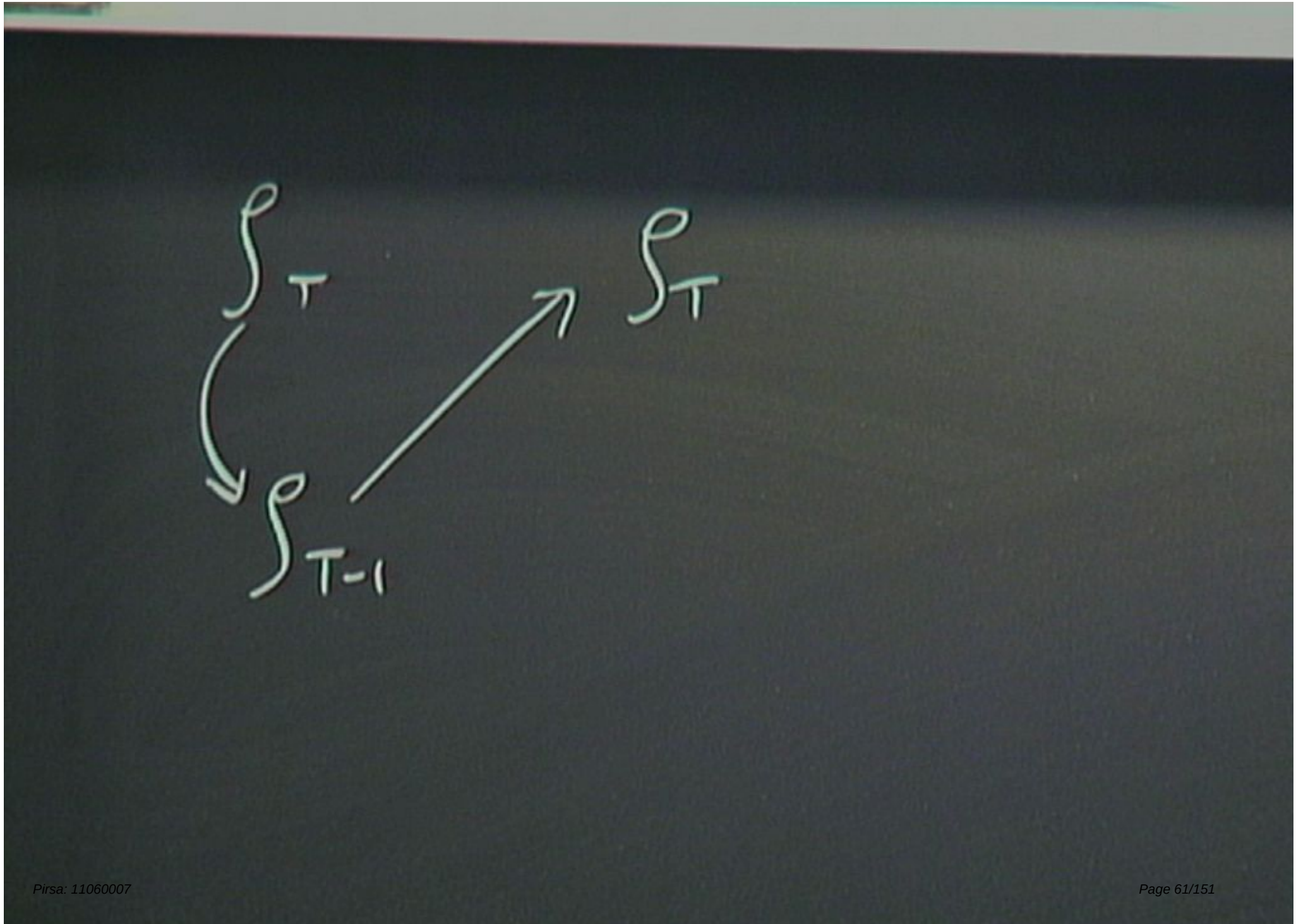

χ8 χ10
?χ8
/3 =
ρnew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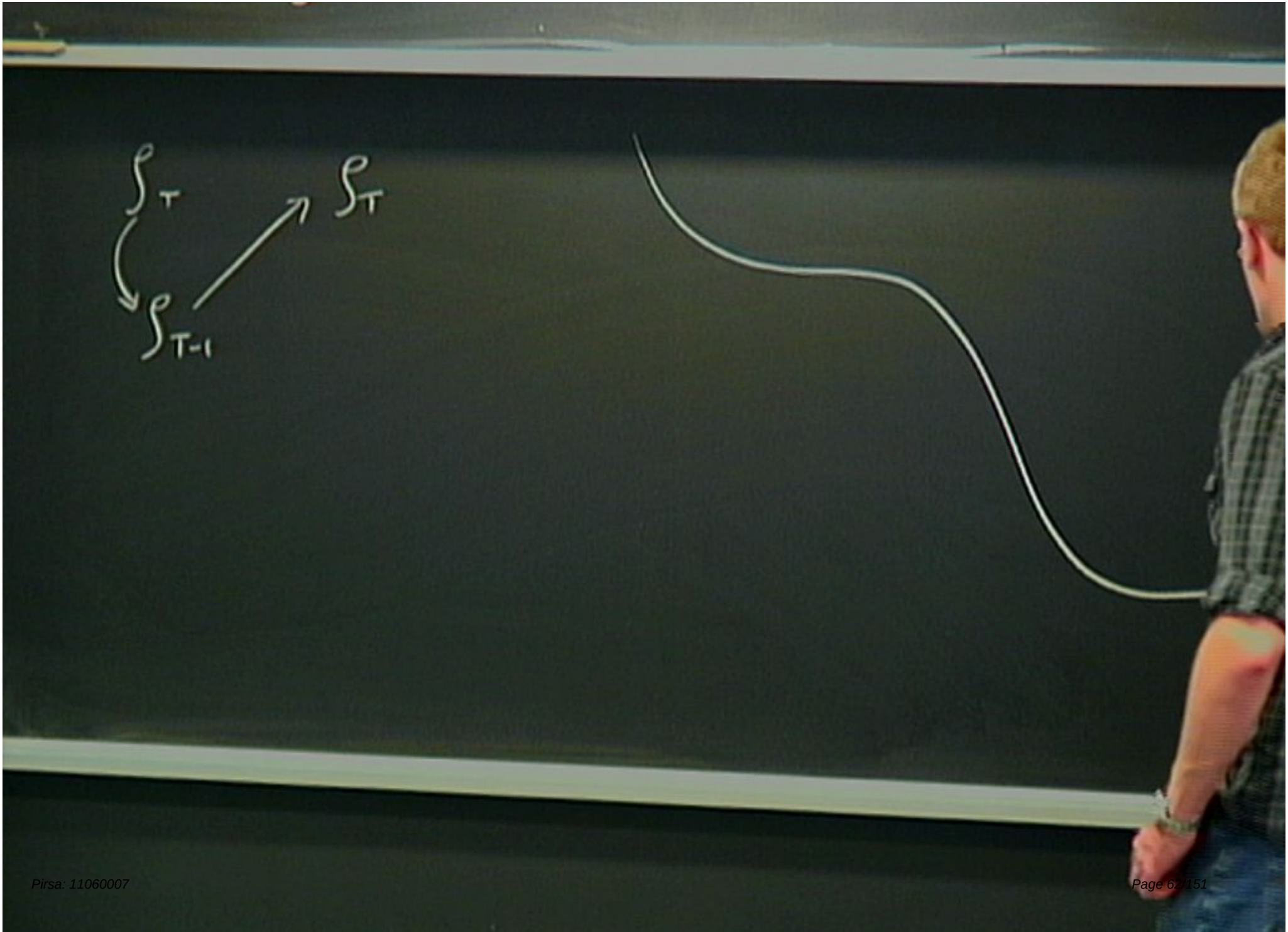
ρ_T
ρ_{T-1}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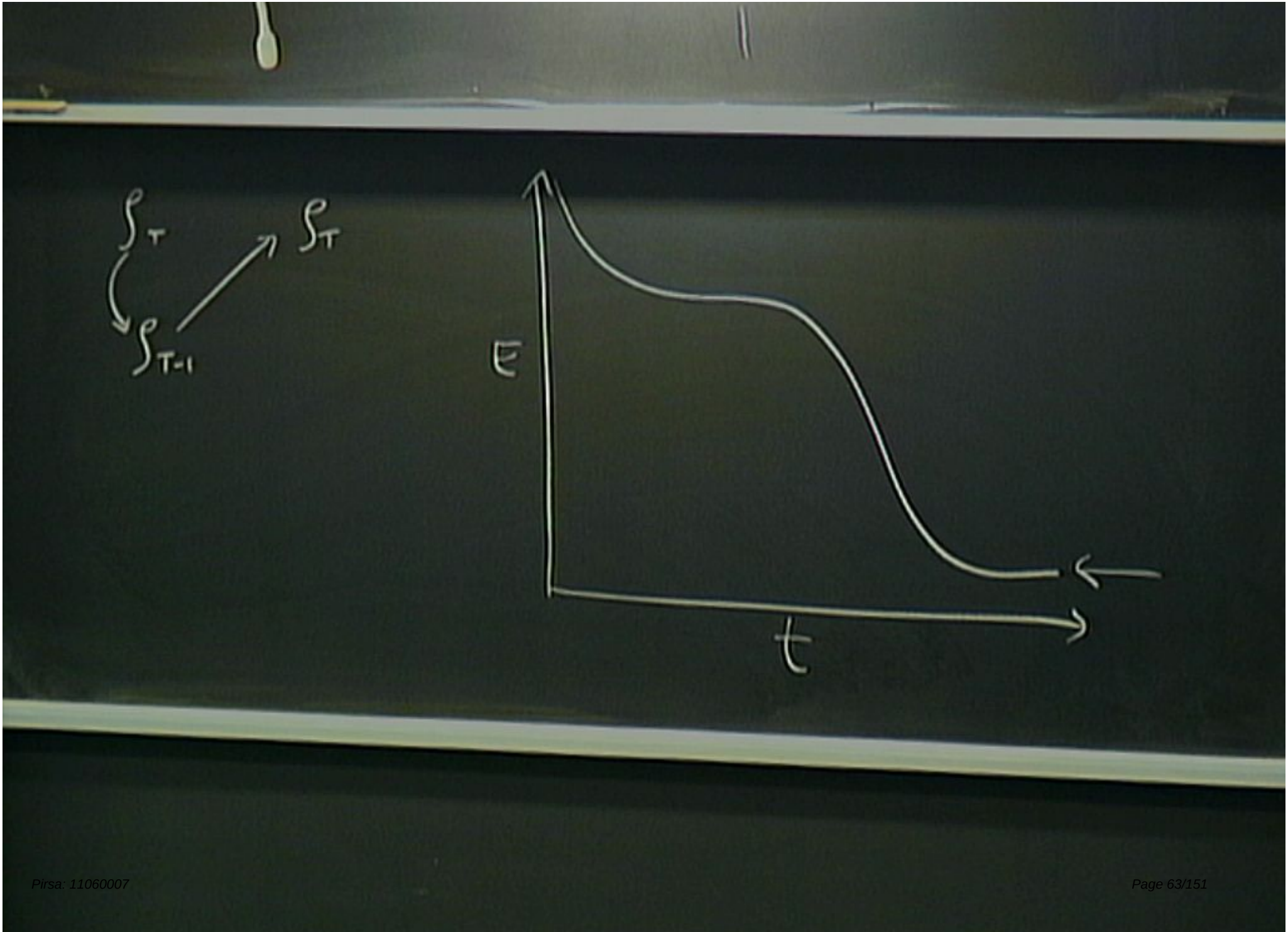
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ρ_T
ρ_{T-1}
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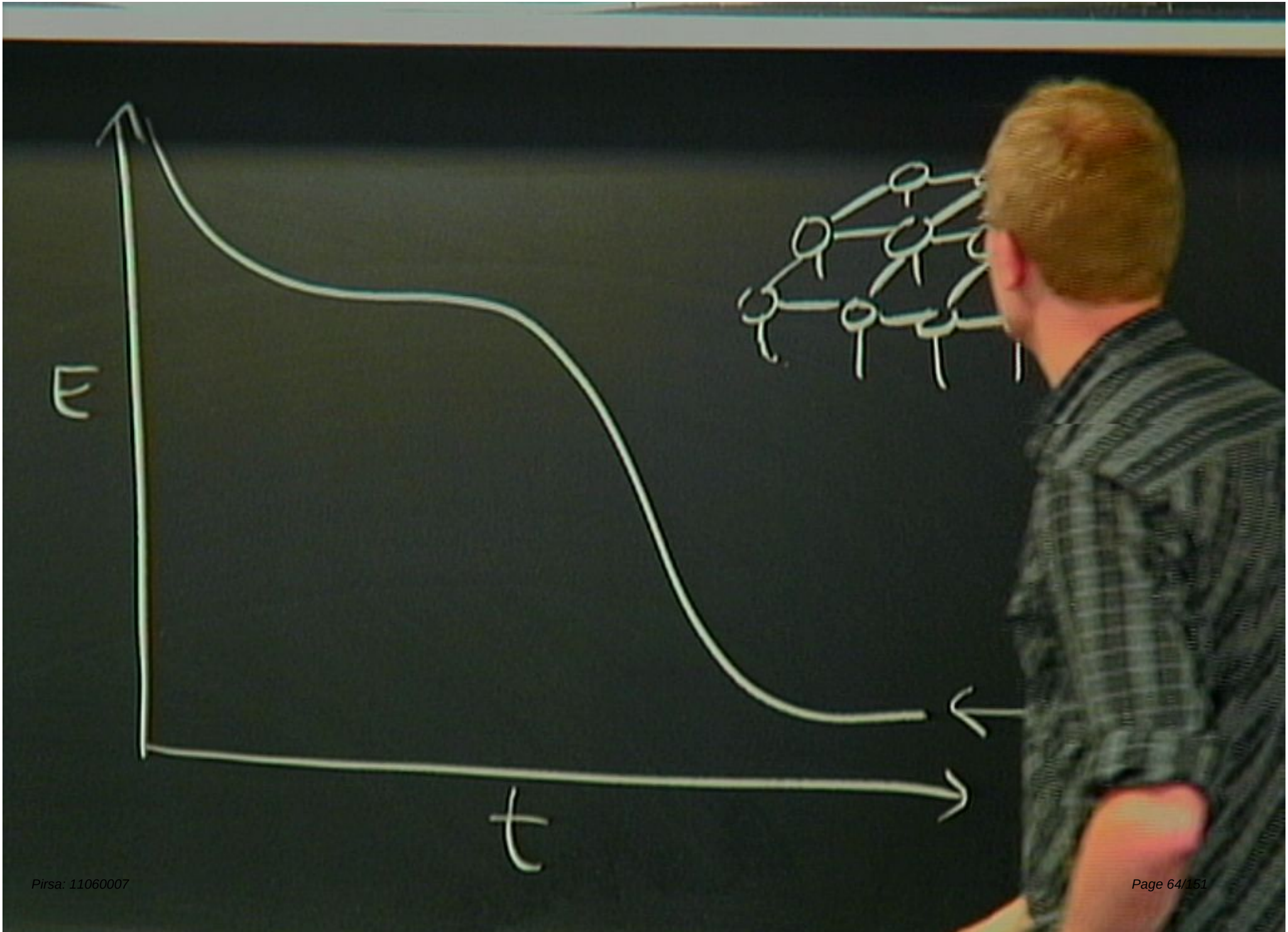
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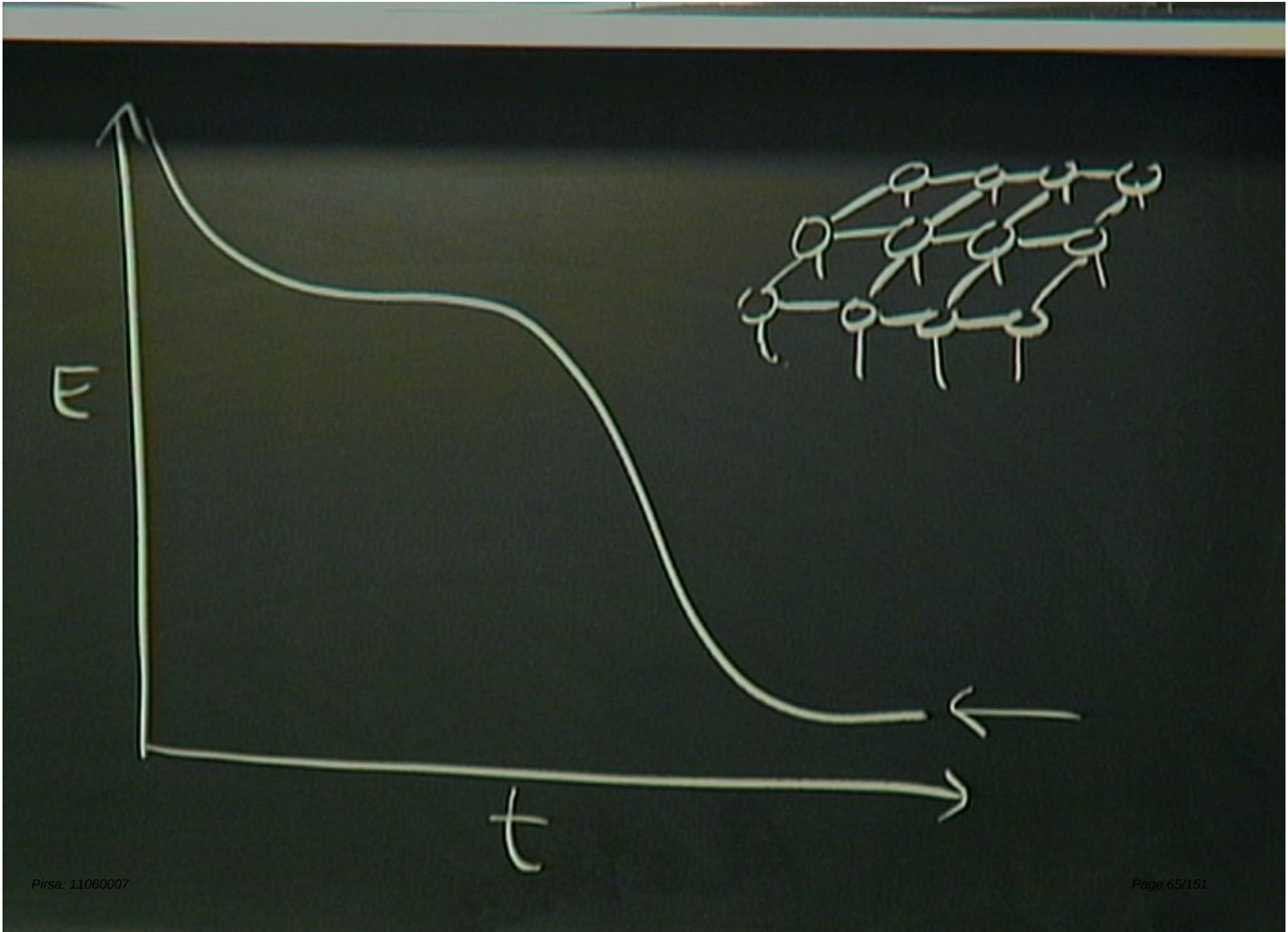
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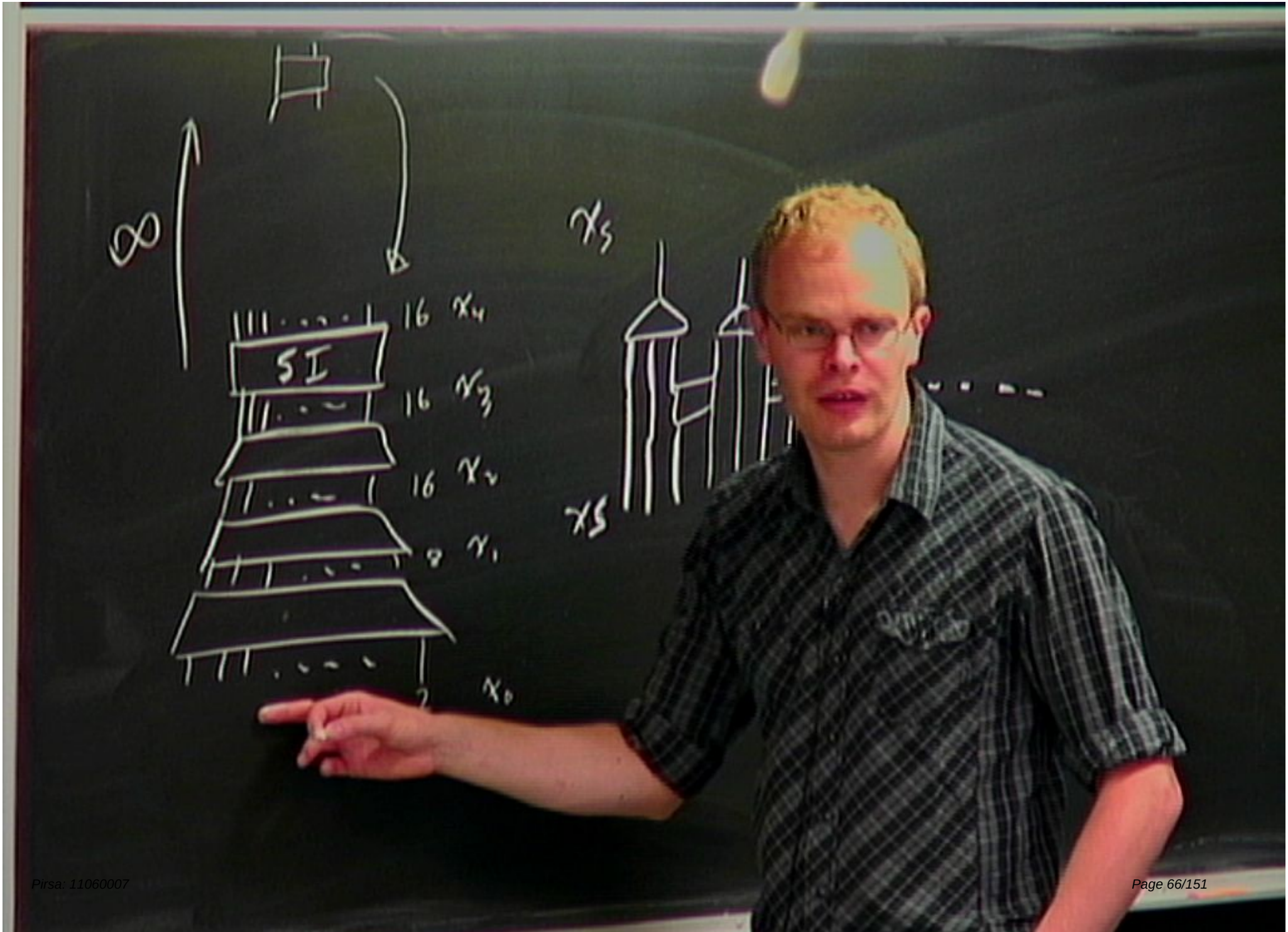
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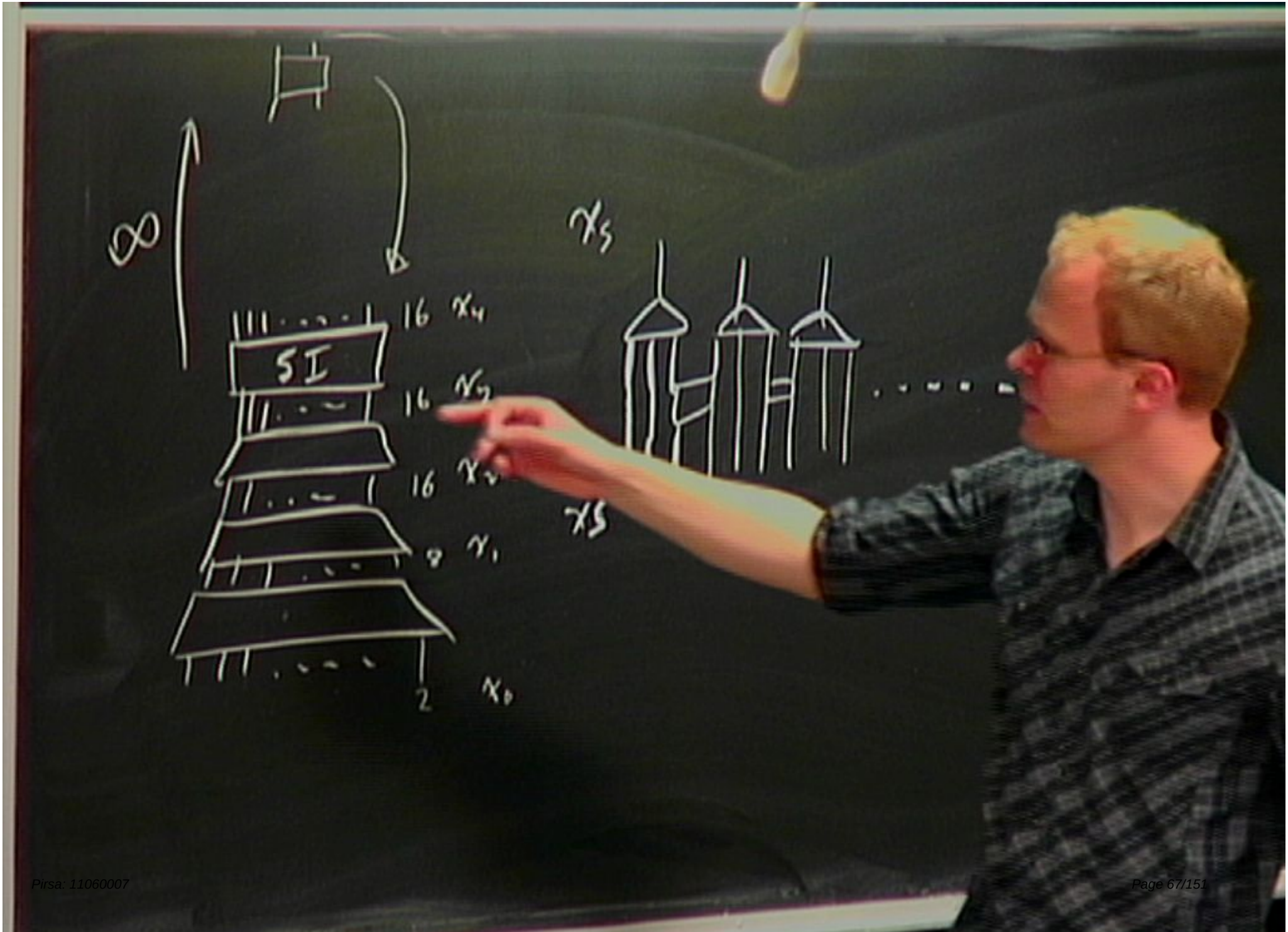
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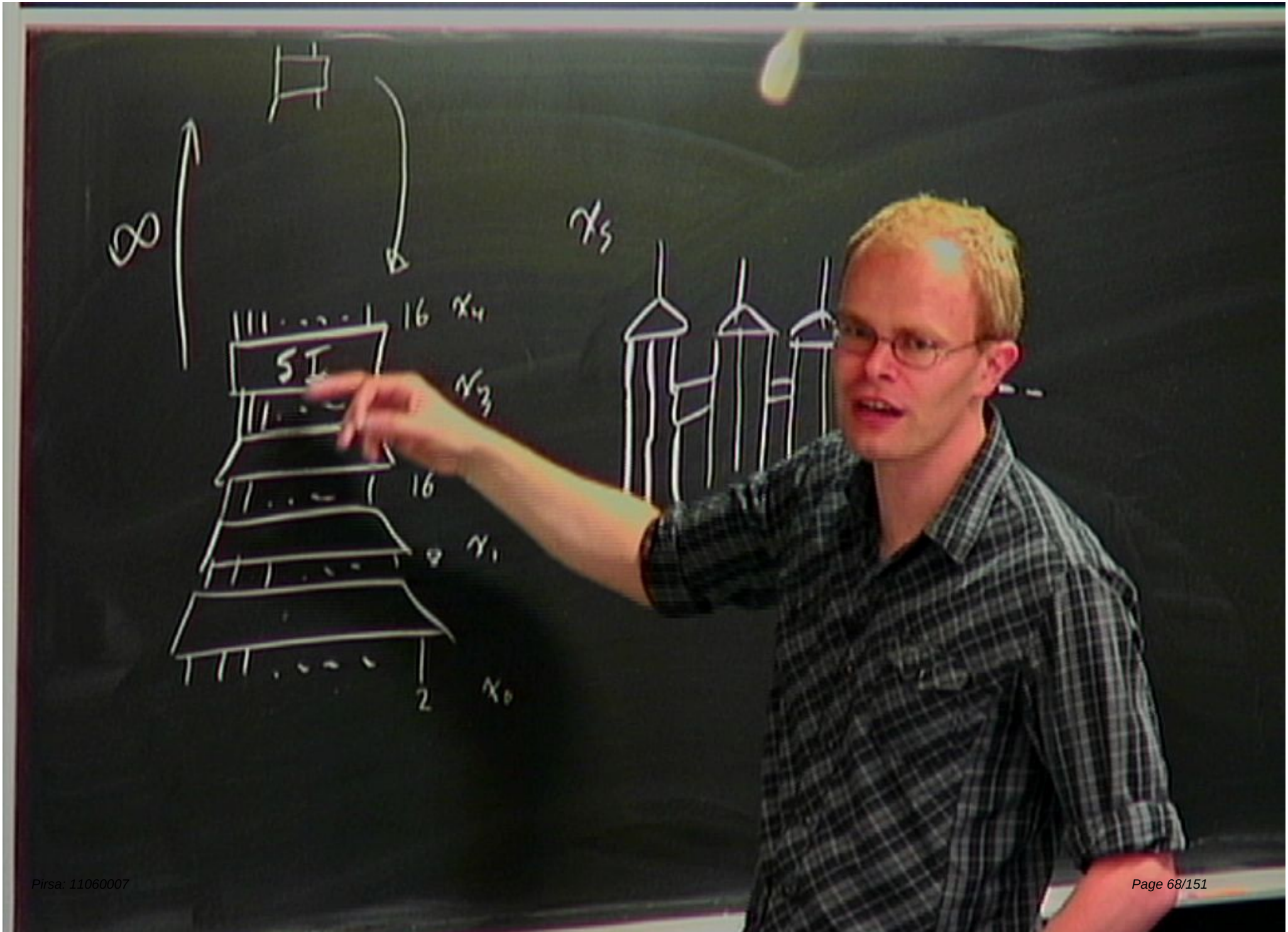
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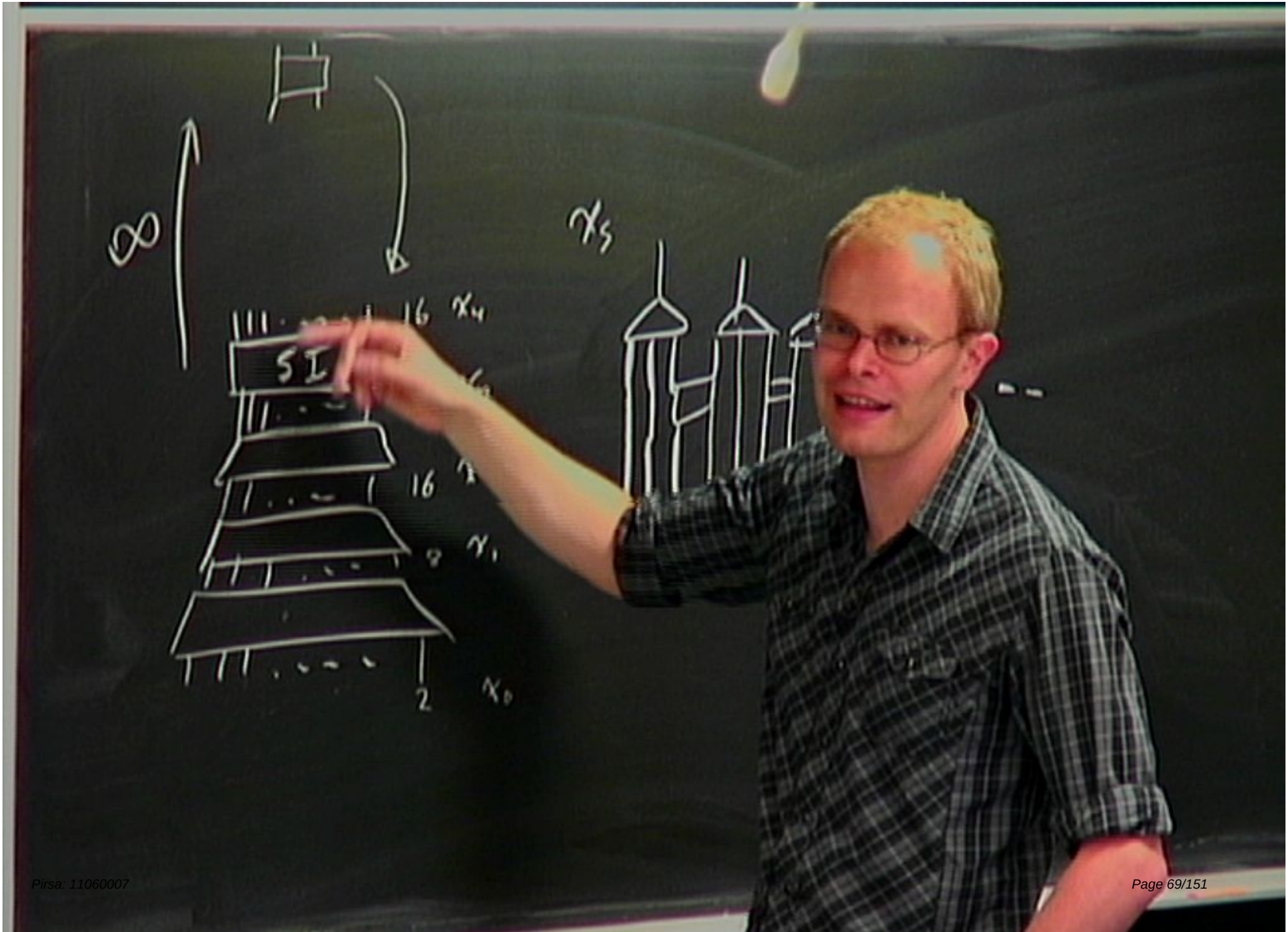
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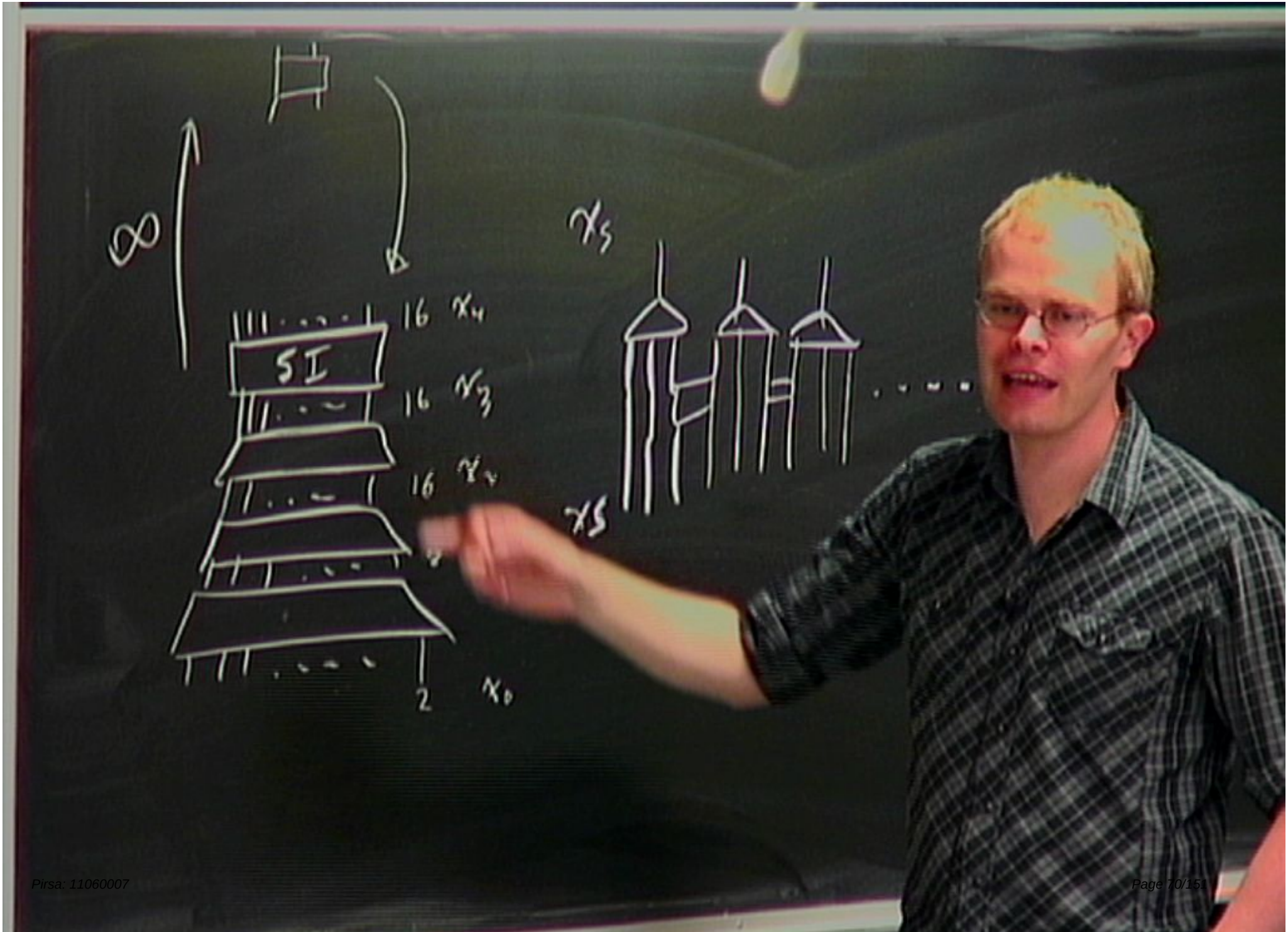
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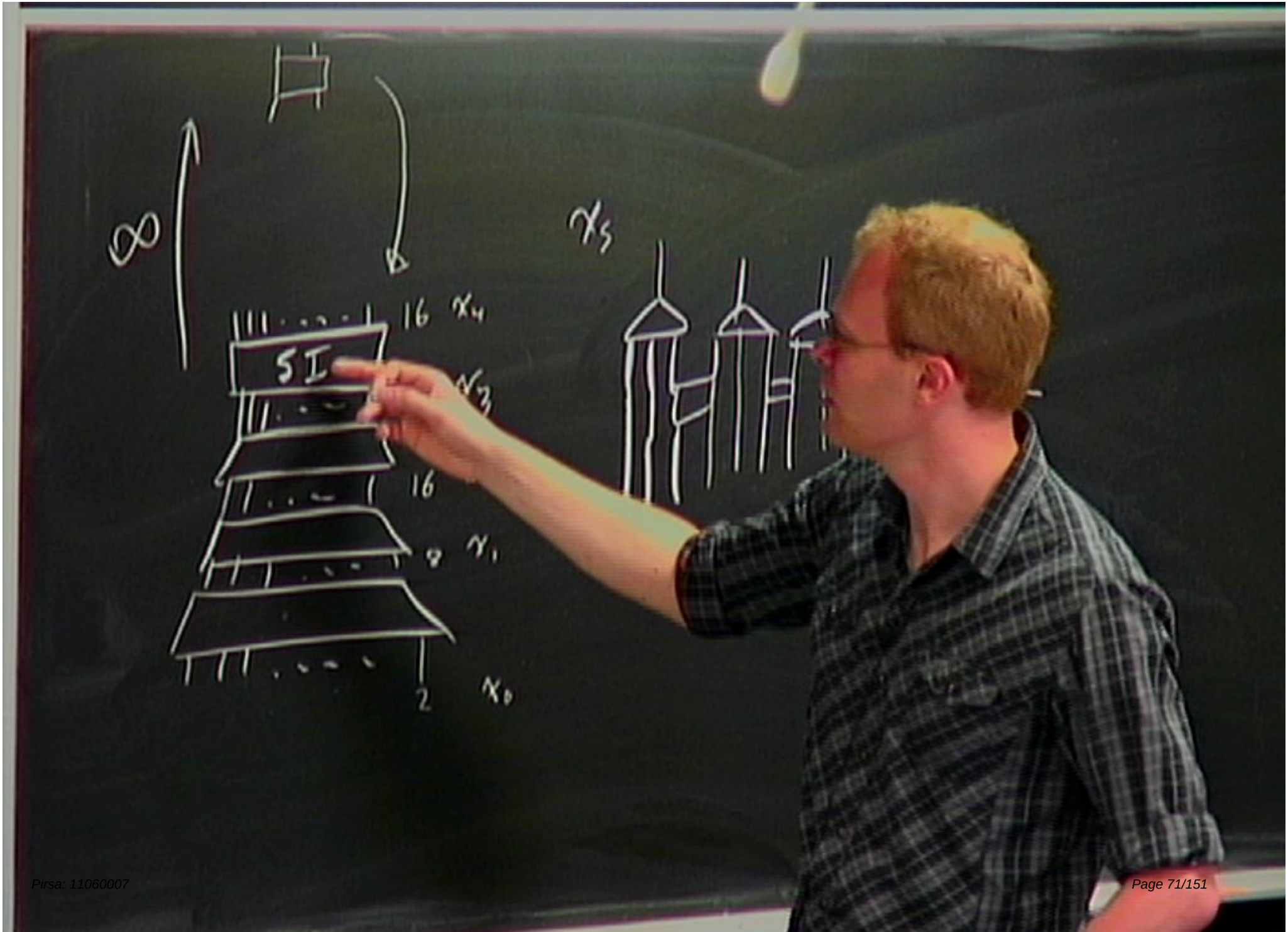
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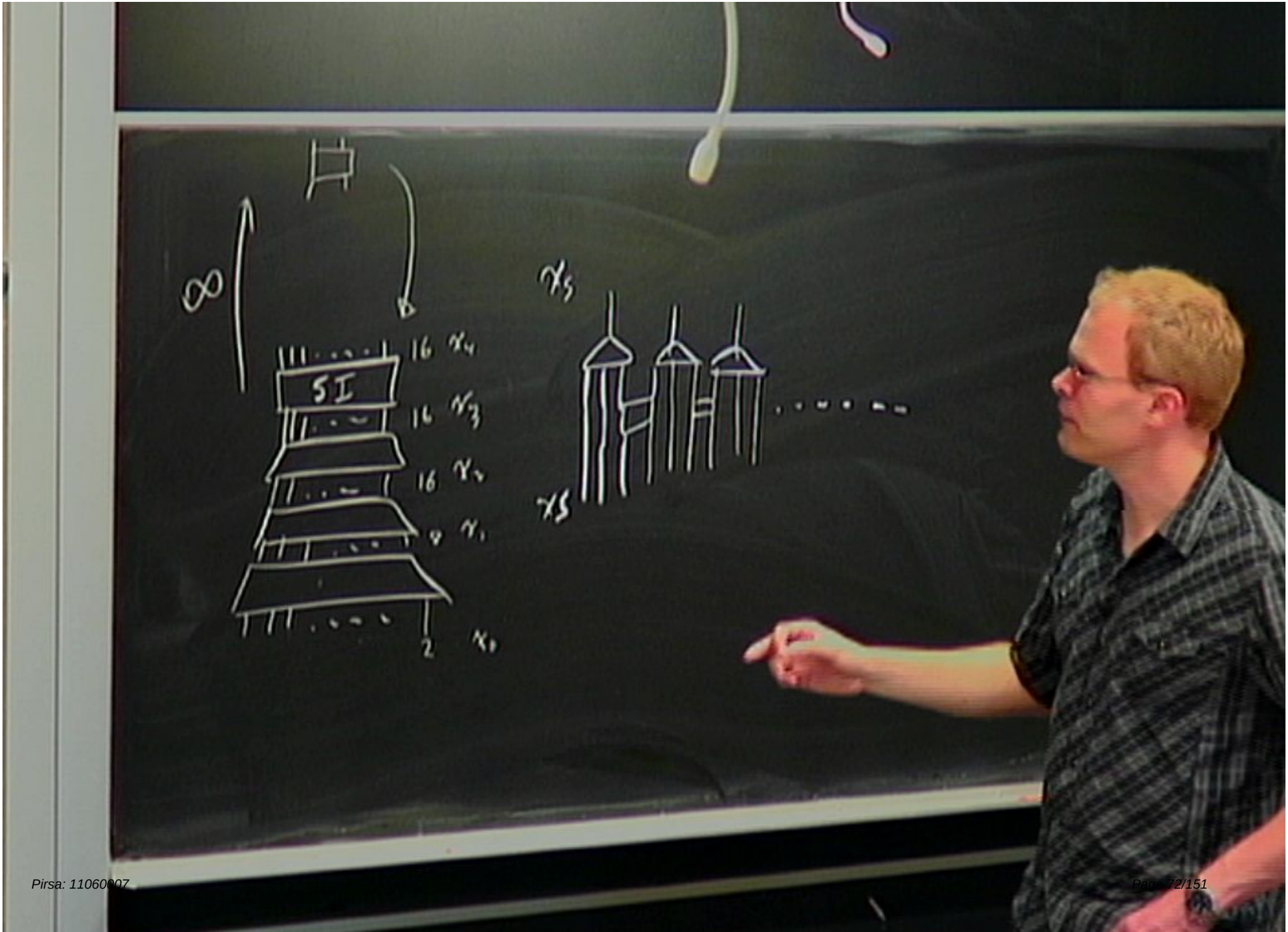
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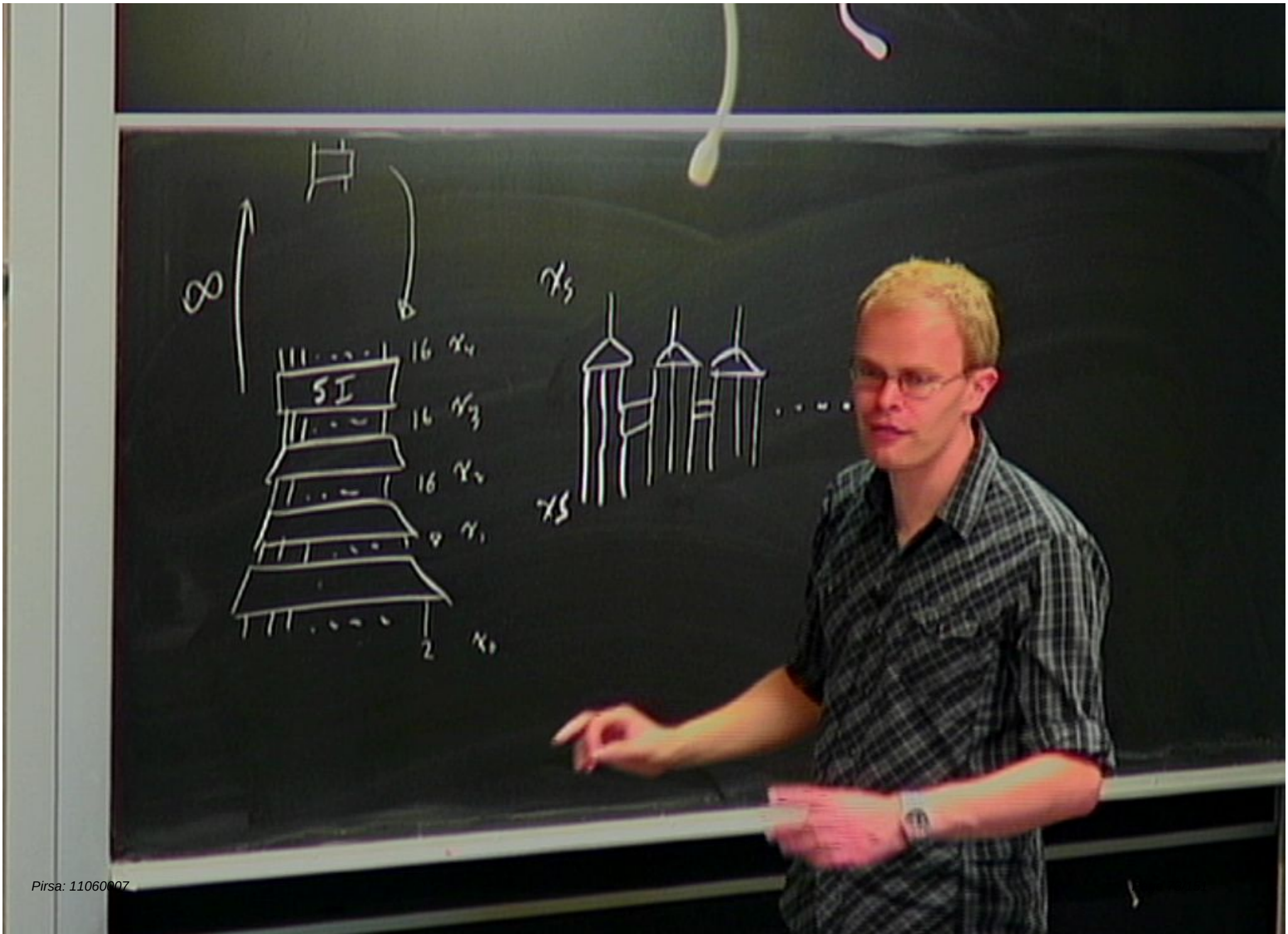

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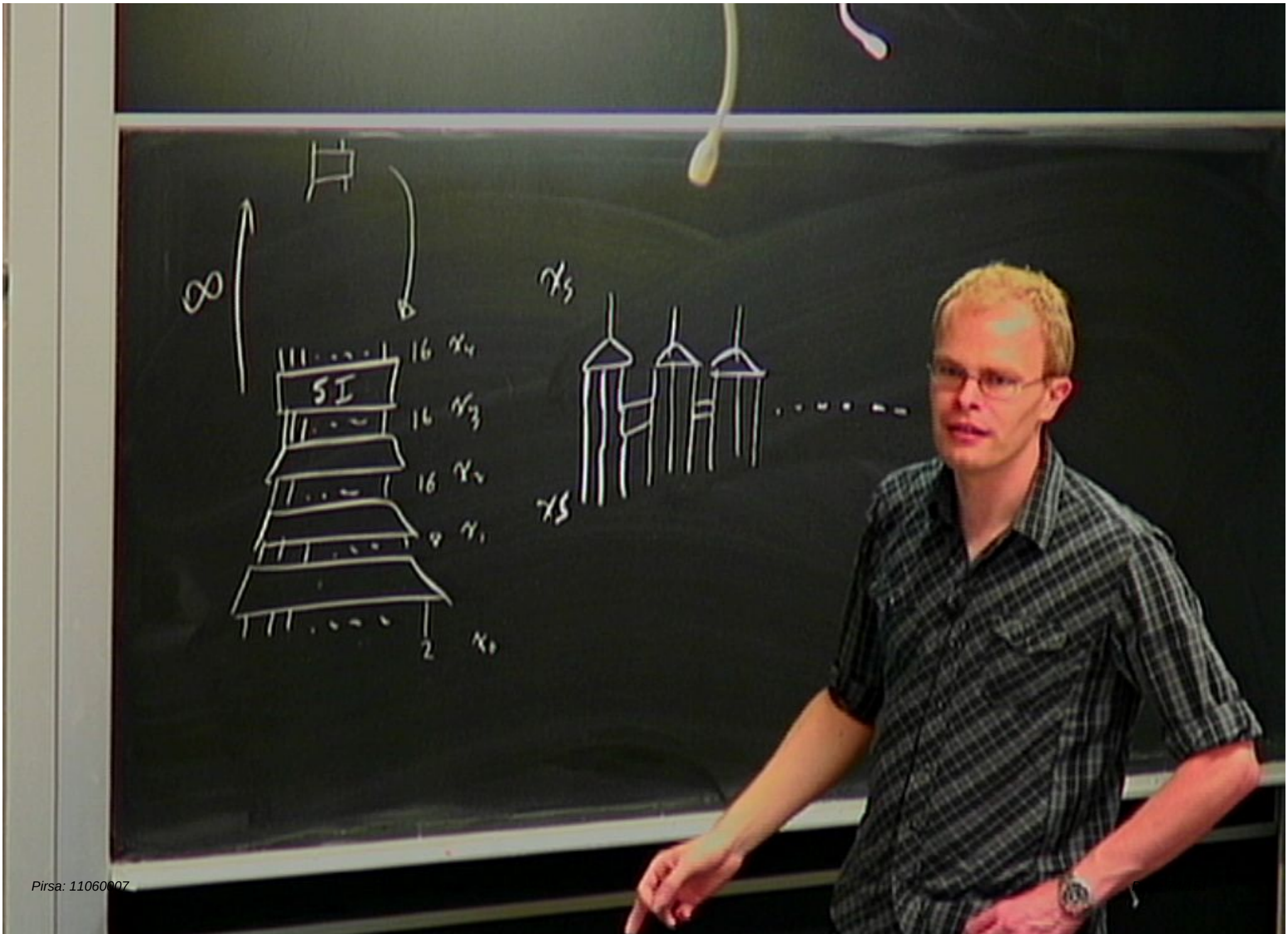
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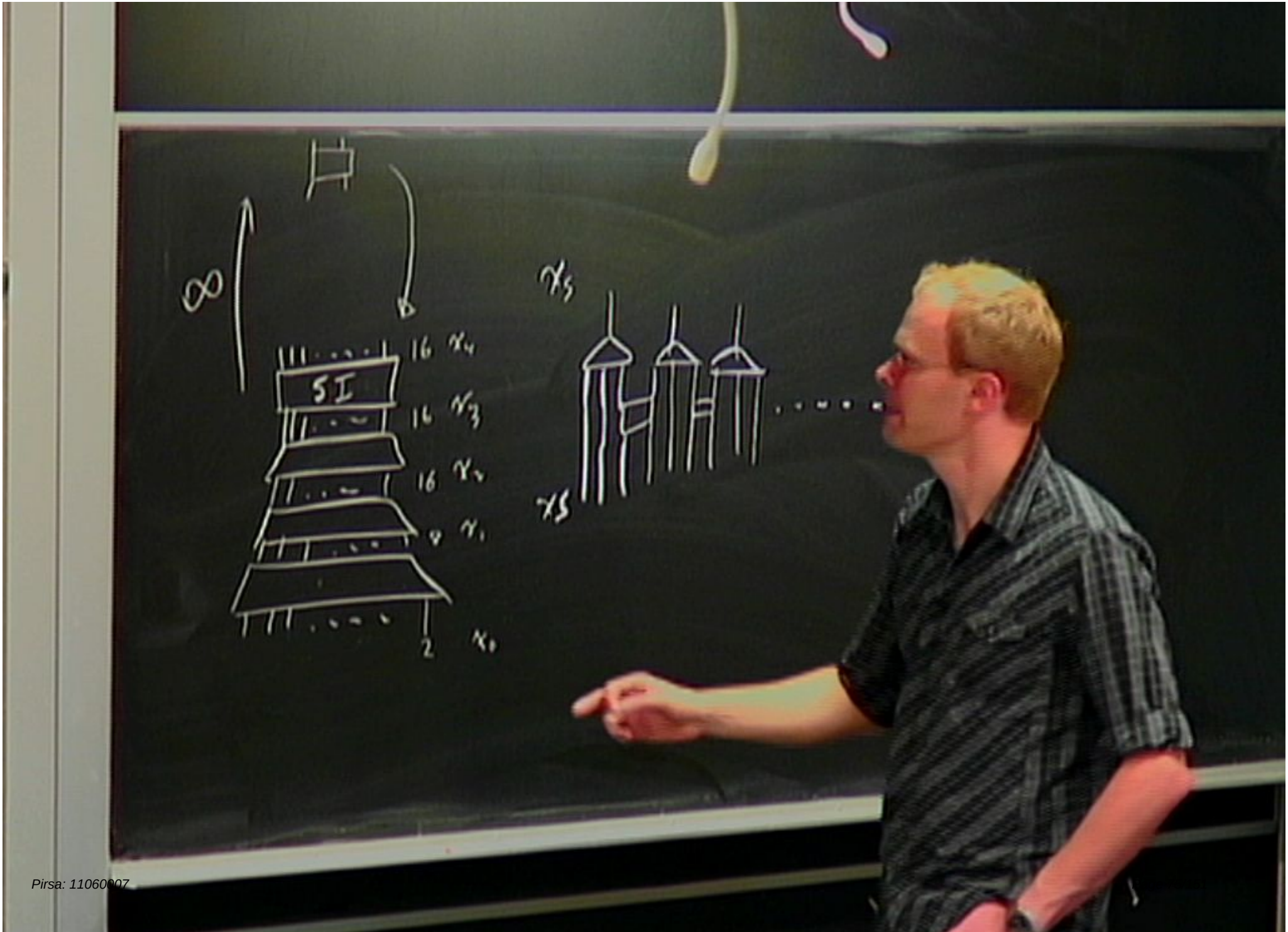

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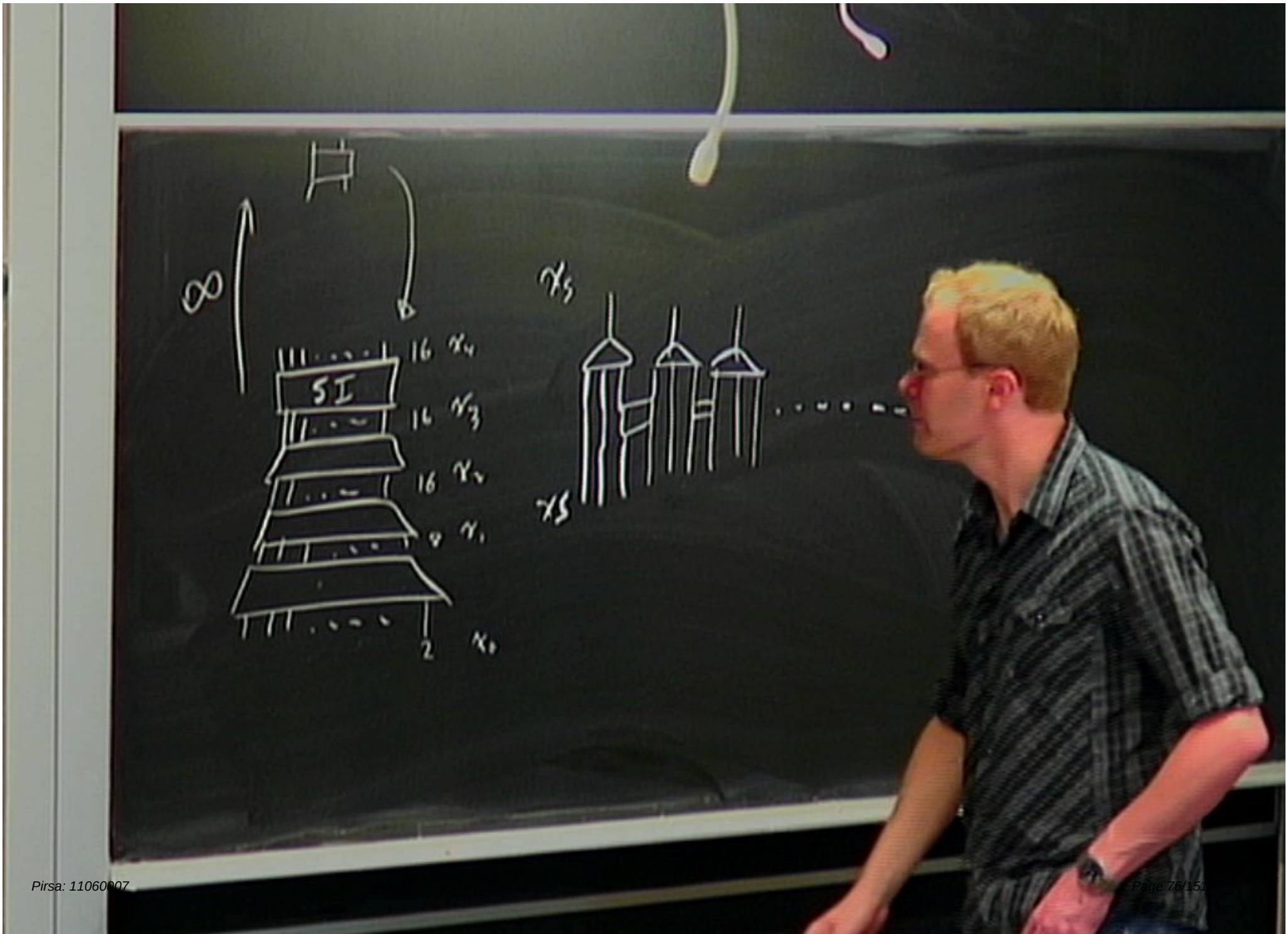
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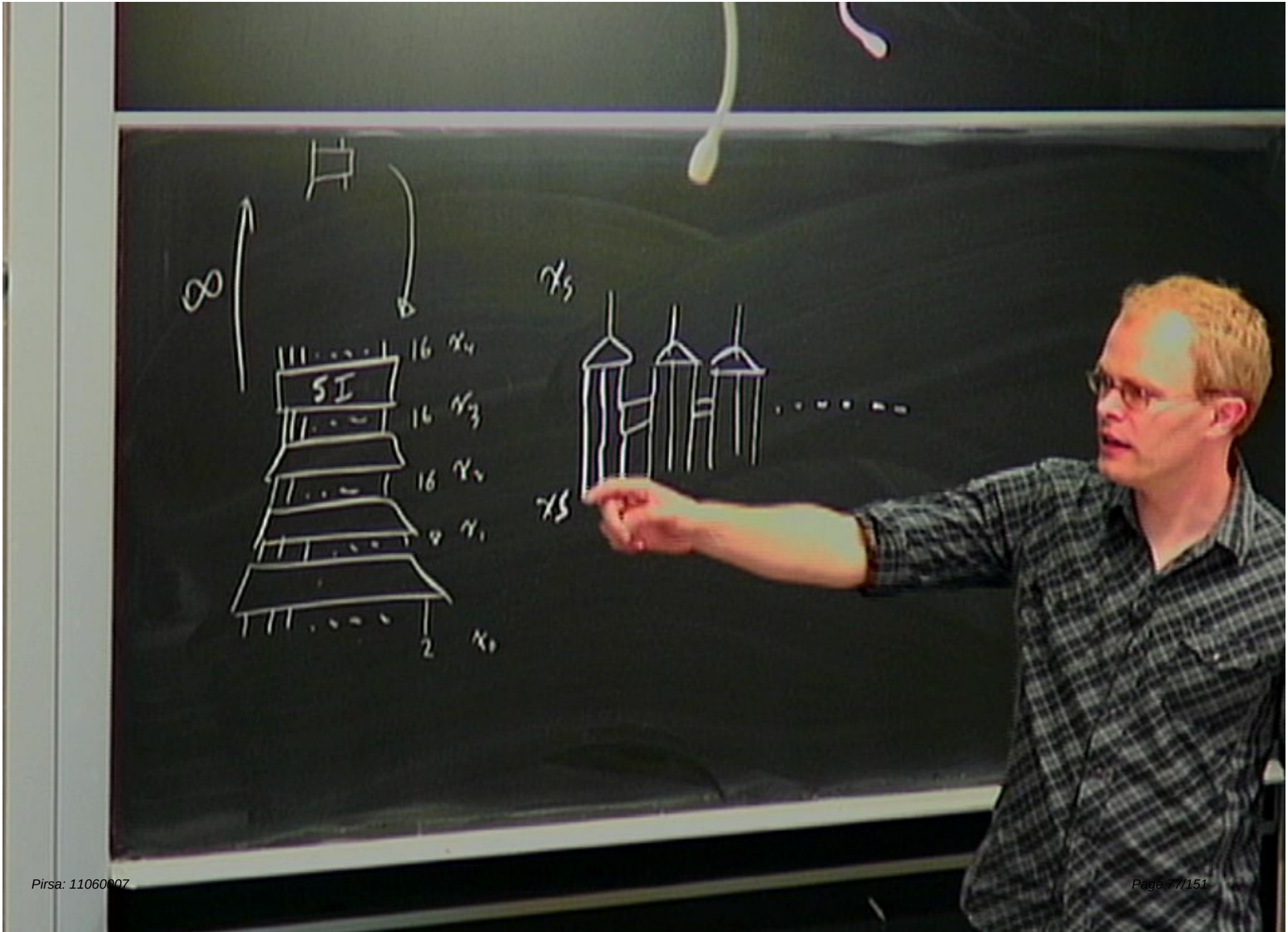
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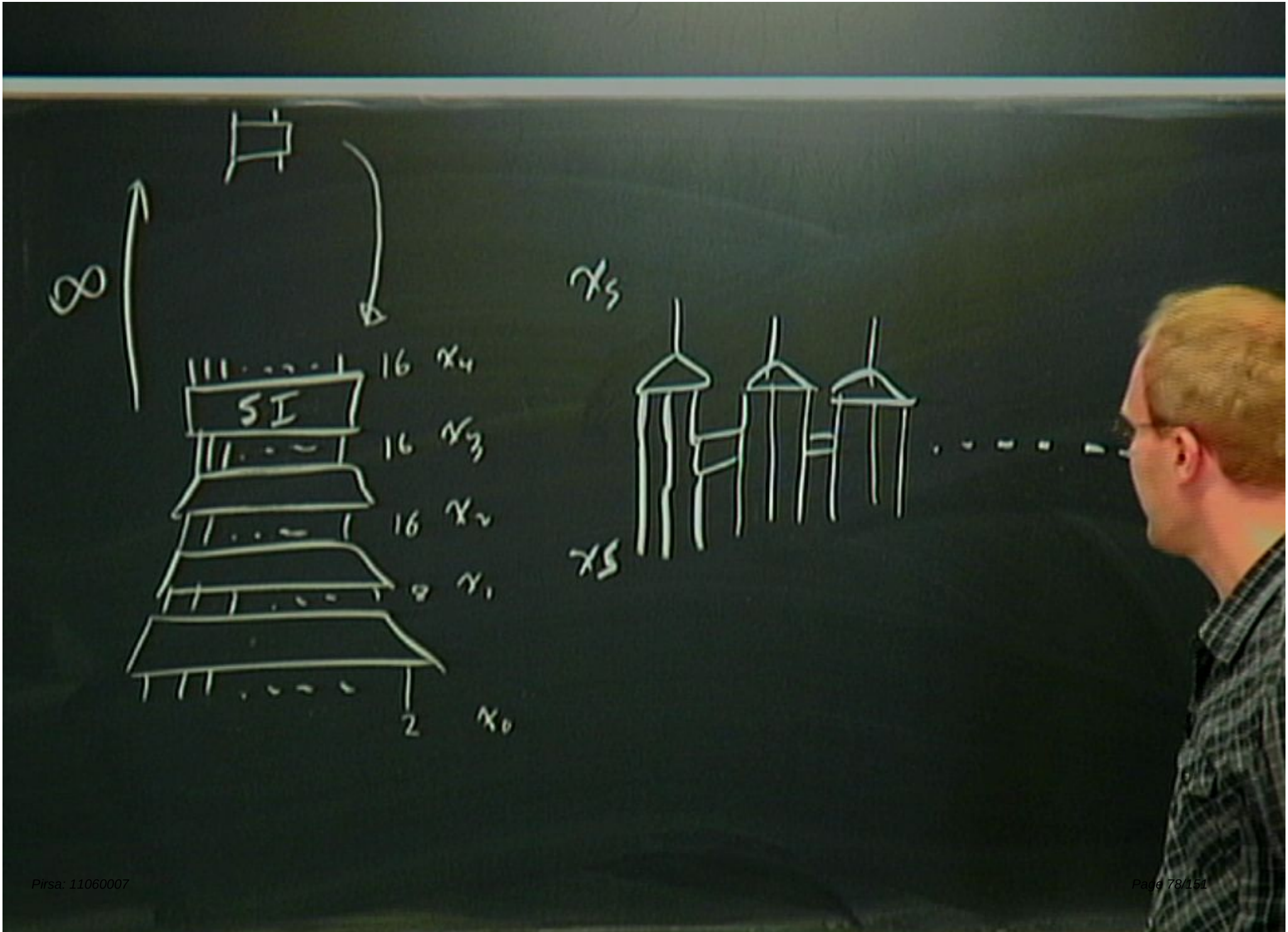
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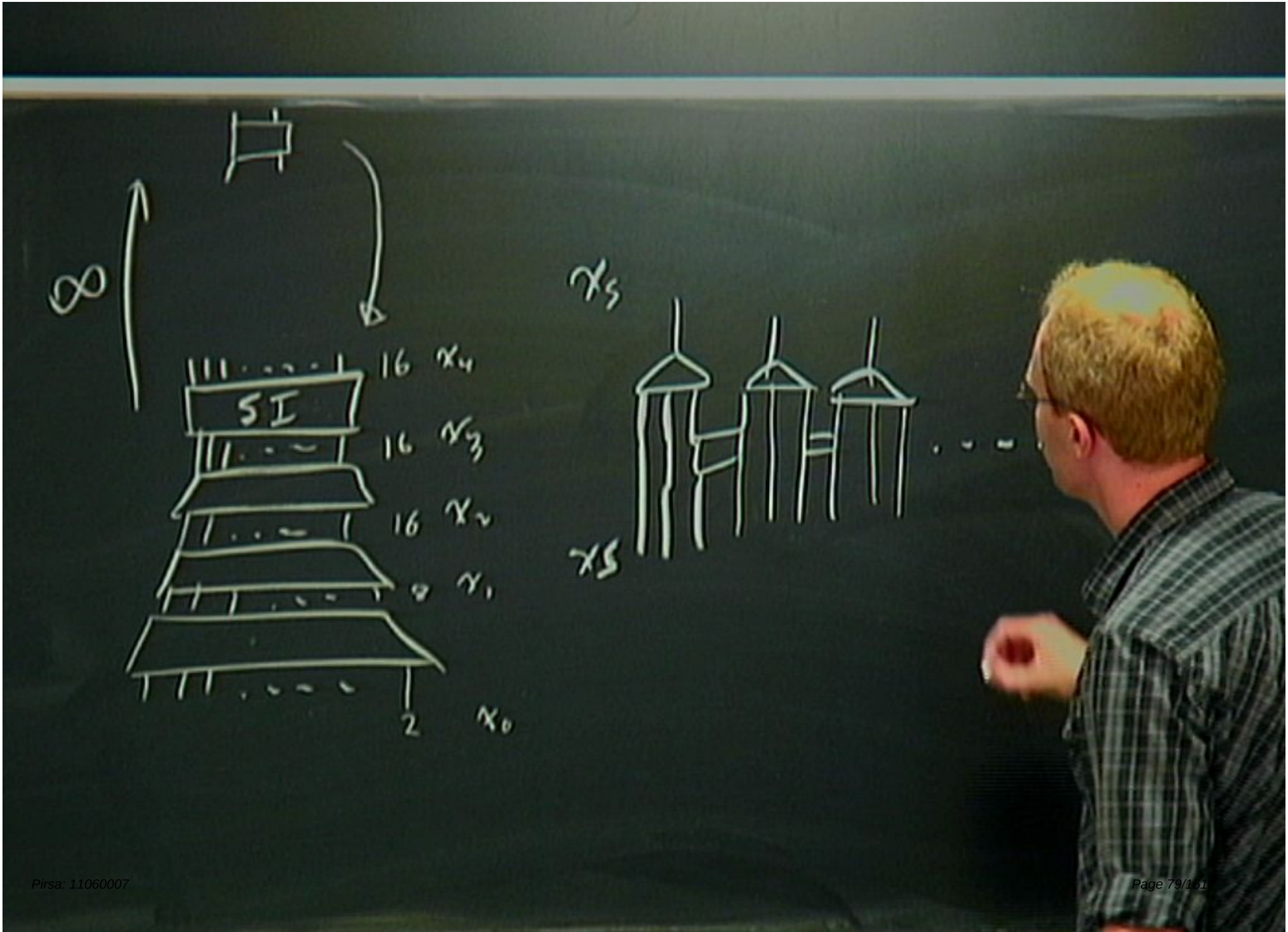
16 $\aleph_2$
8 $\aleph_1$
2 $\aleph_0$
$\aleph_5$
$\aleph_5$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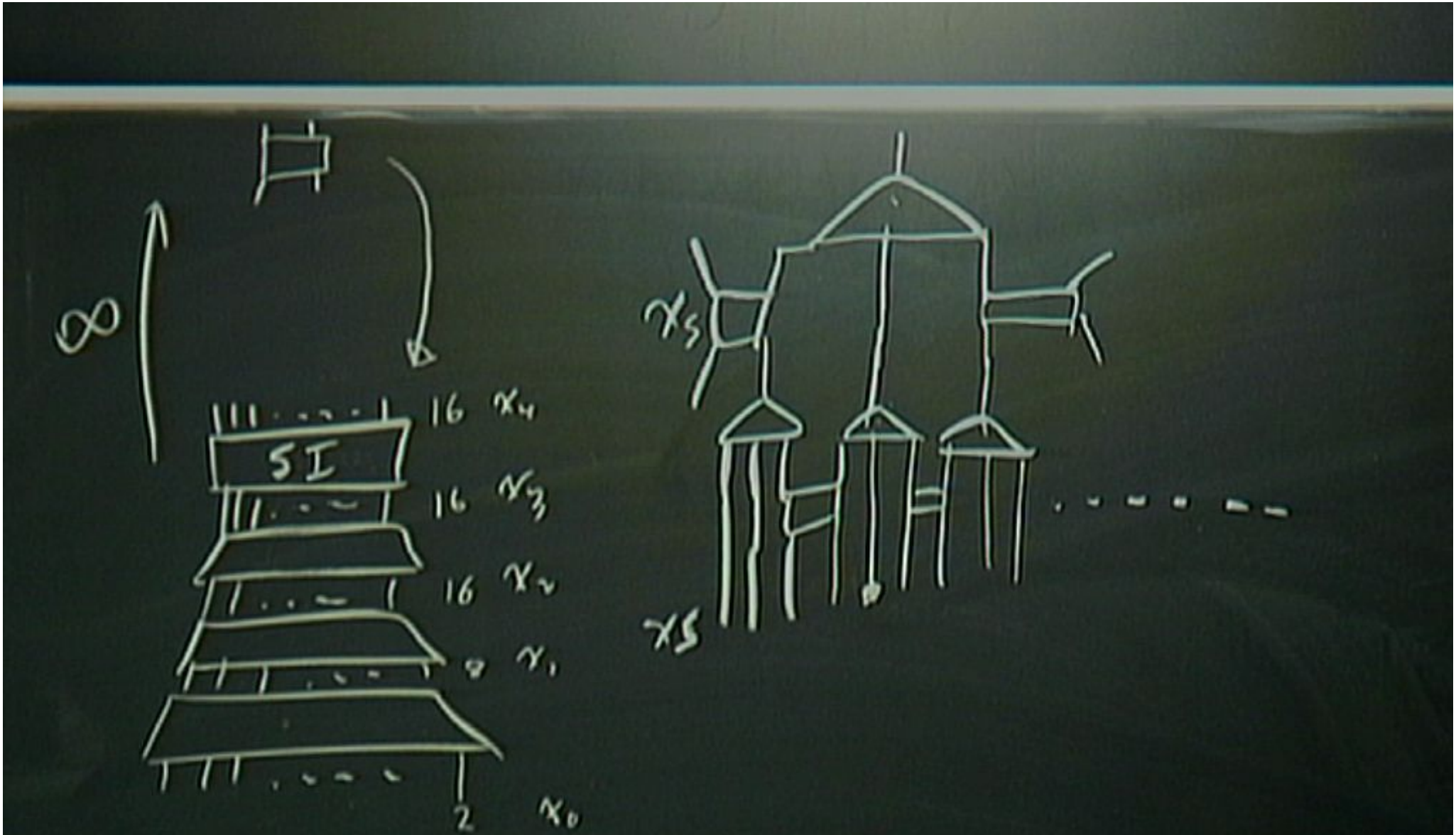
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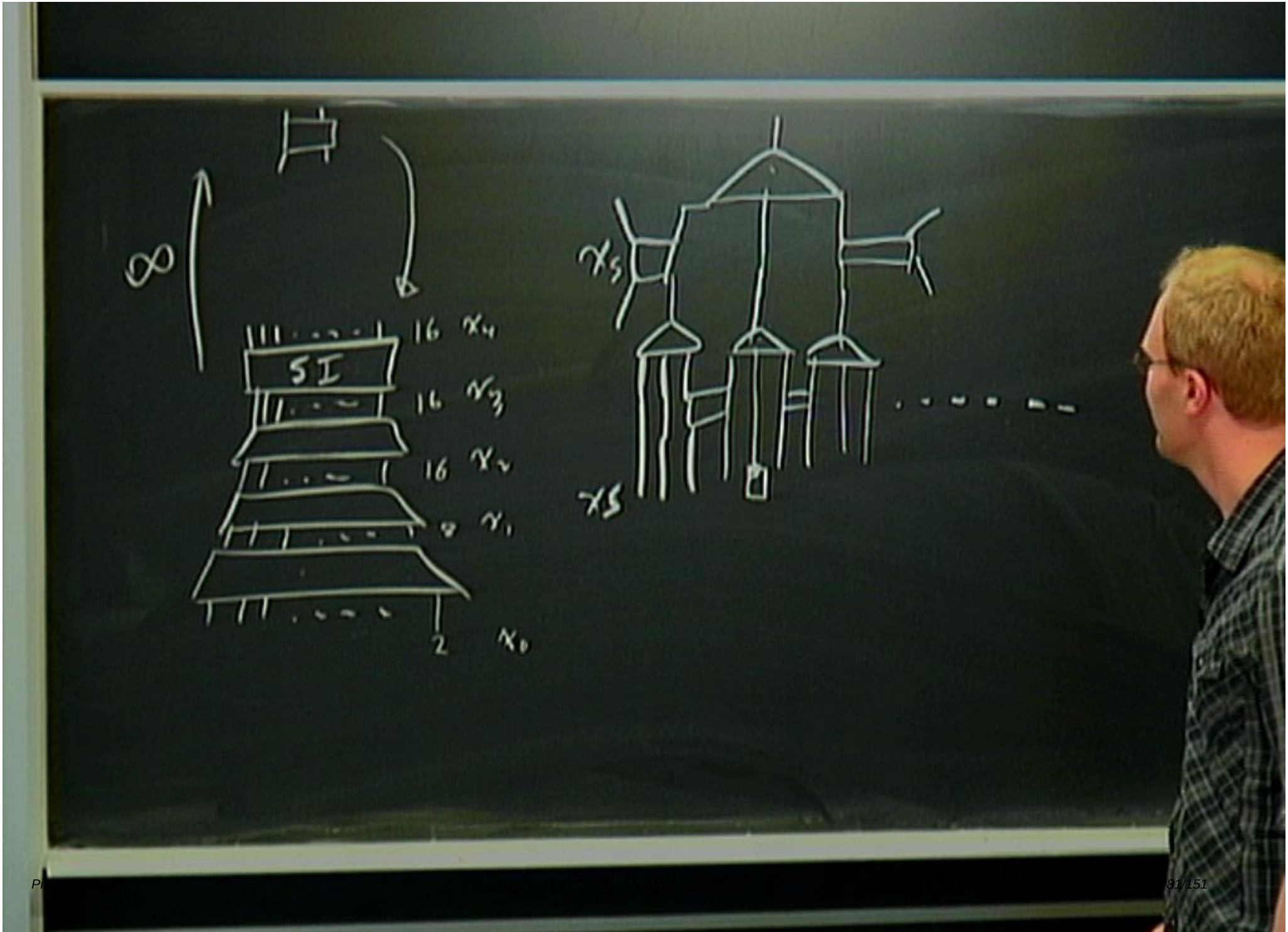
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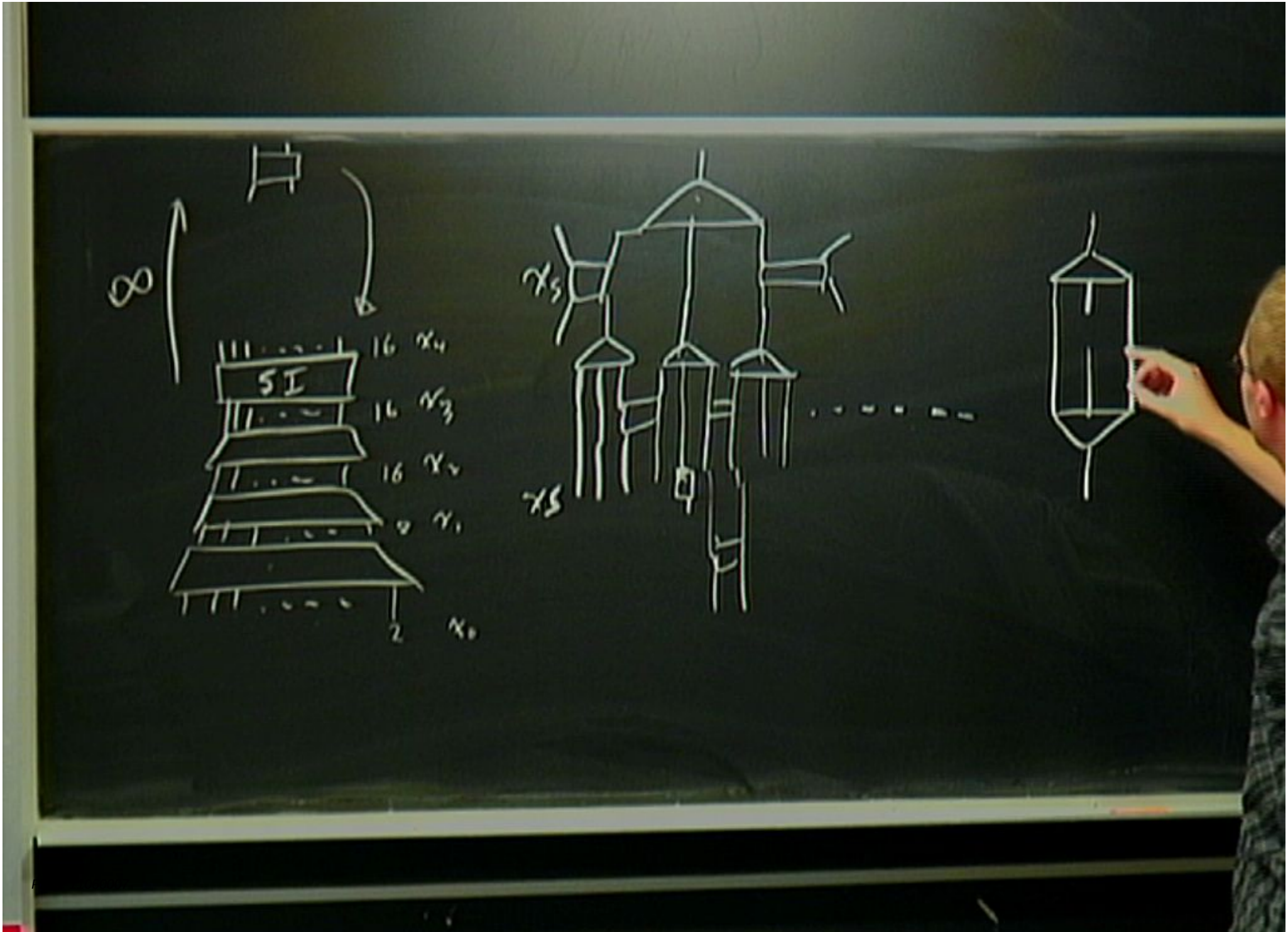
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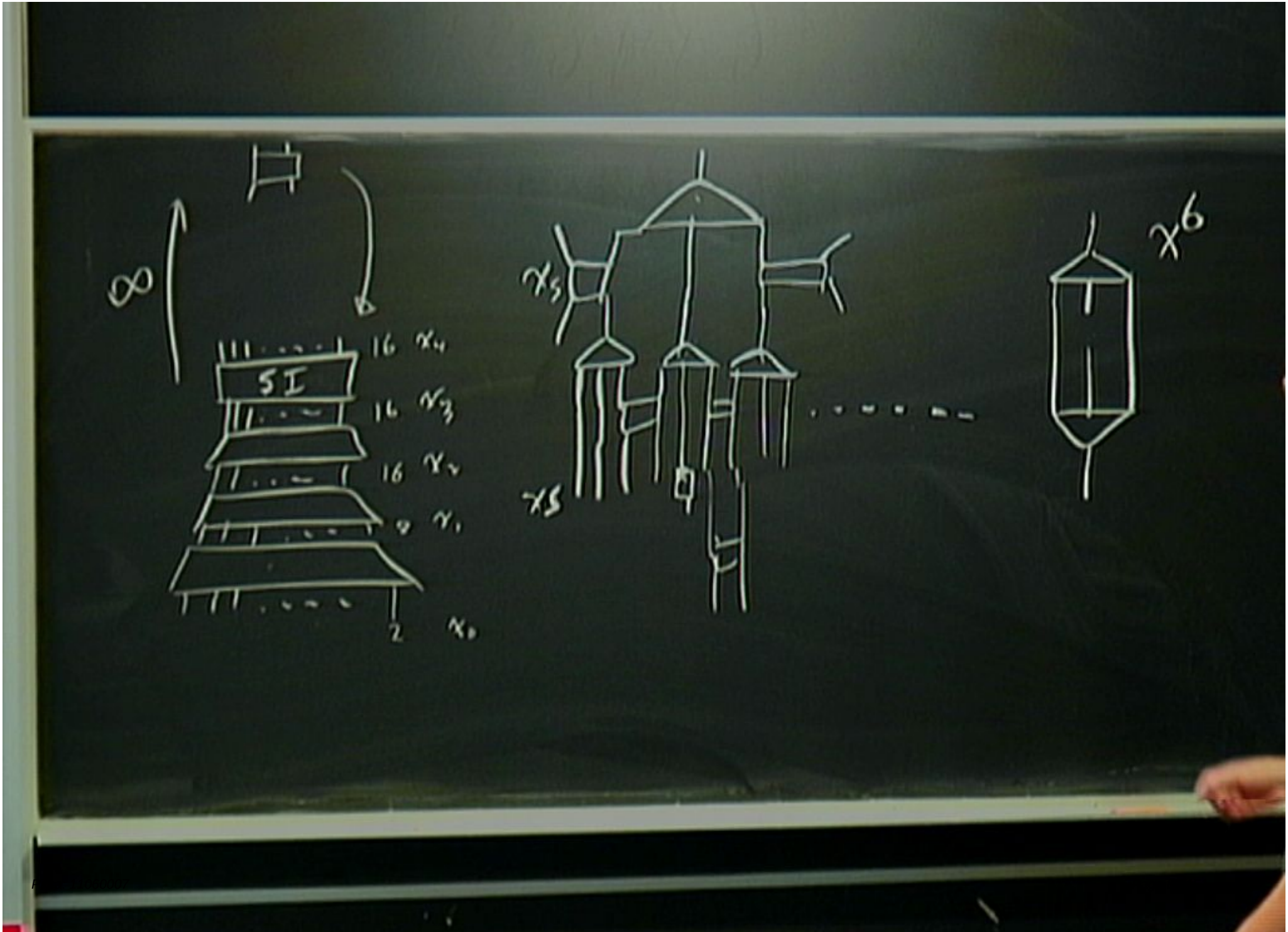
16 x_3
16 x_2
2 x_0
x_5
x_5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SI
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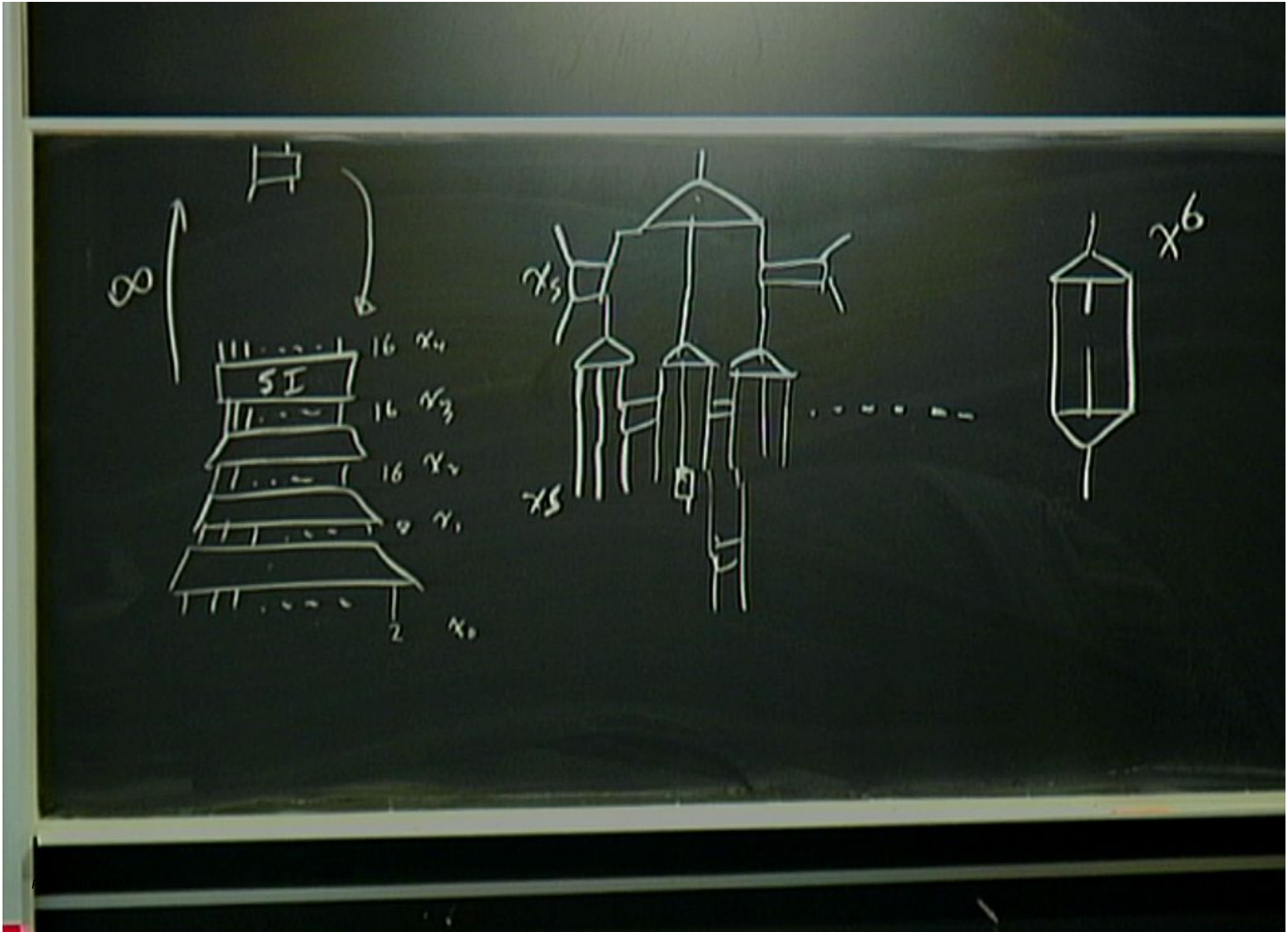
16
16
9
2
χ_5
χ_6
χ_5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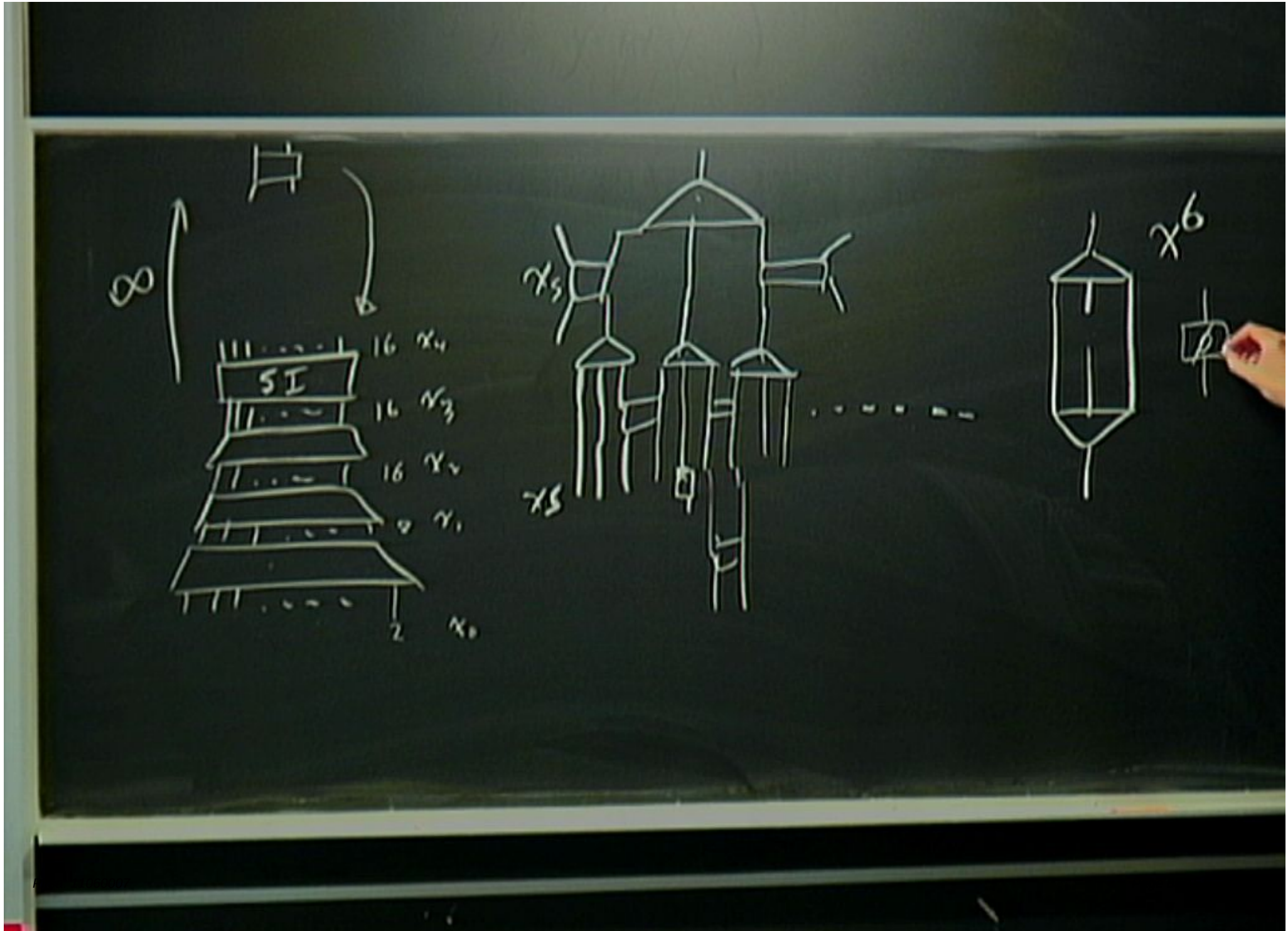
SI
16 x_4
16 x_3
16 x_2
4 x_1
2 x_0
x_5
x_5
x^6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SI
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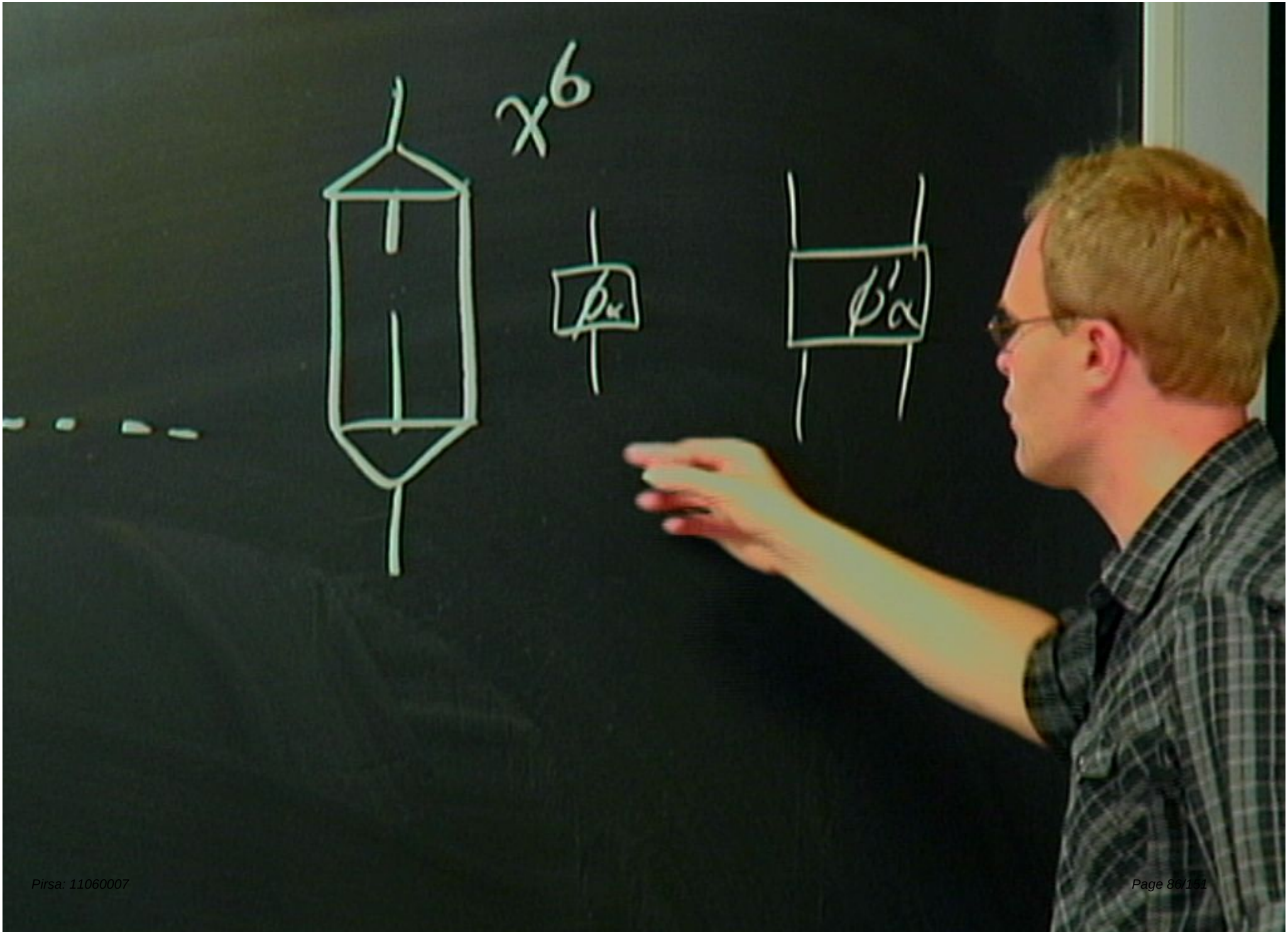
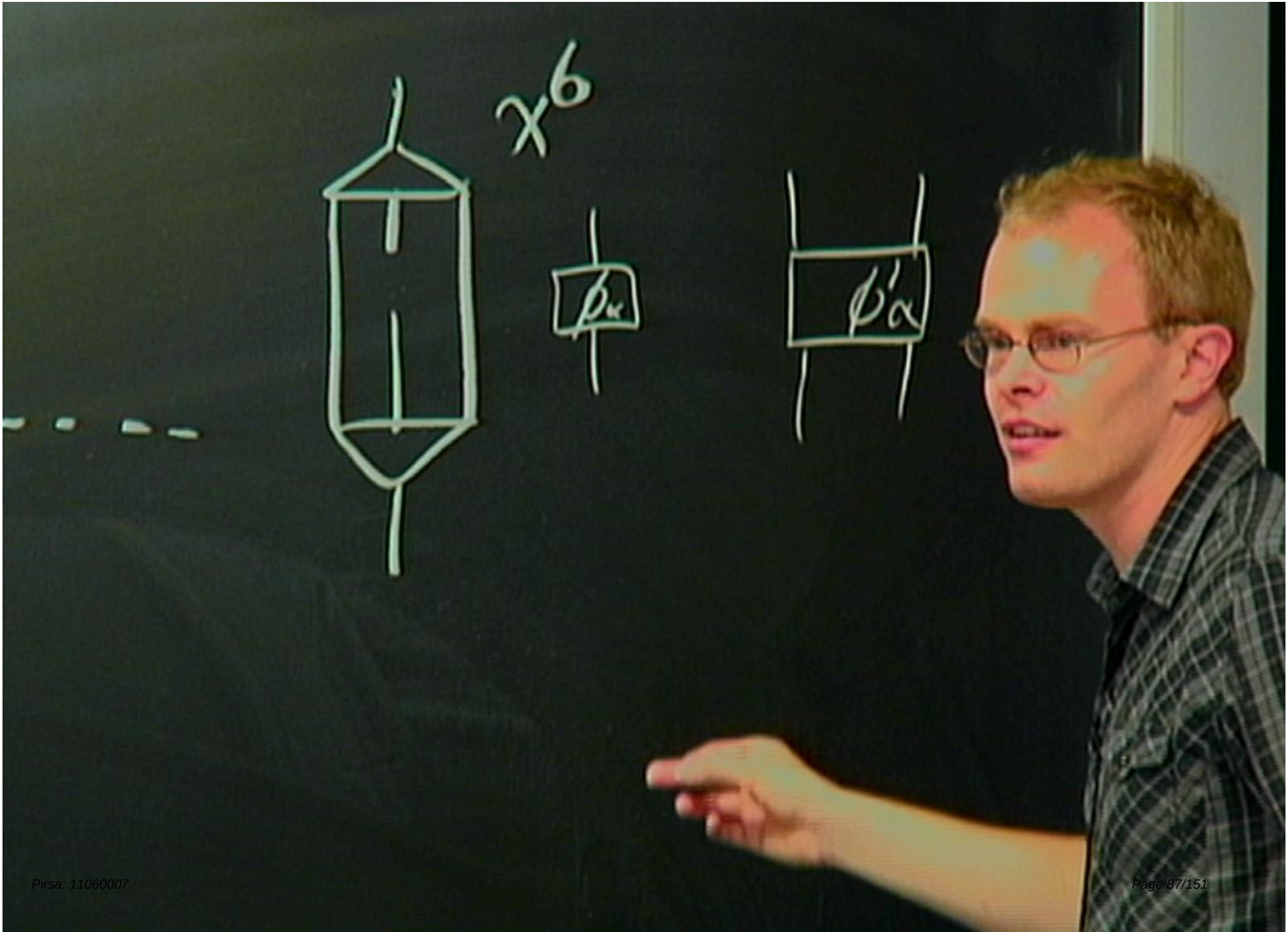
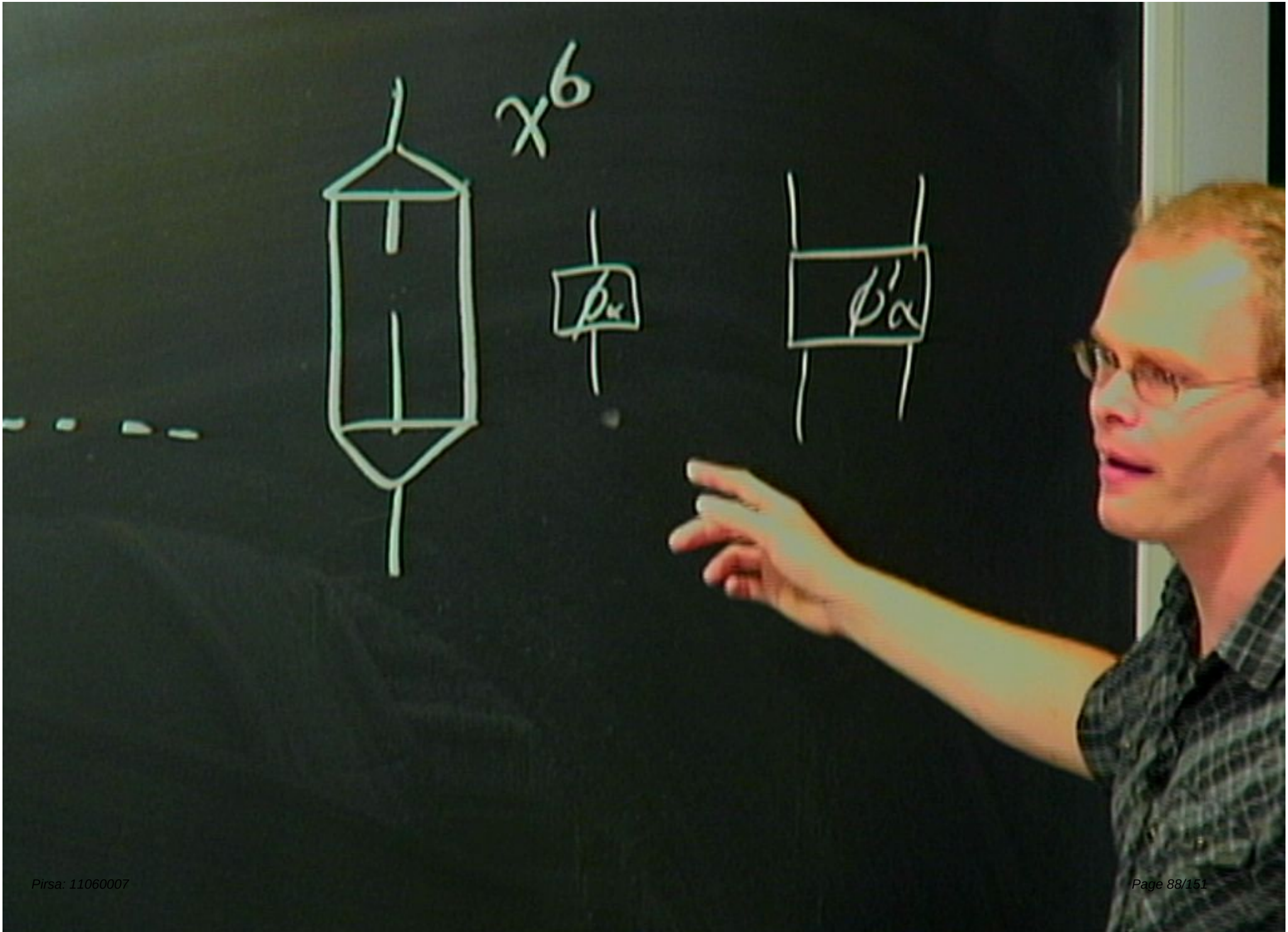
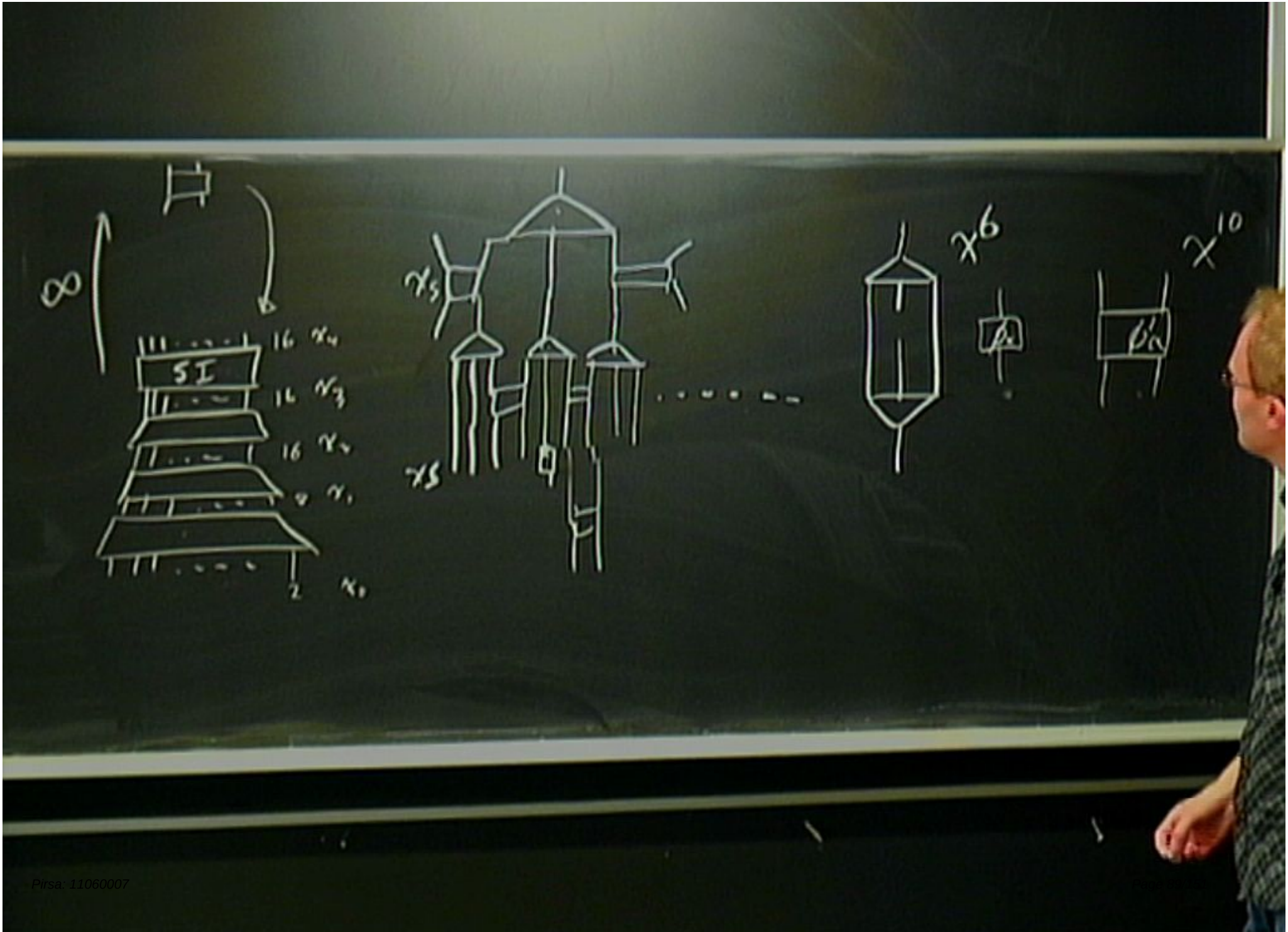
16 α_3
16 α_2
8 α_1
2 α_0
α_5
α_6


x^6
ϕ_α
ϕ'_α


x^6
ϕ_α
ϕ'_α


x^6
ϕ_α
ϕ'_α



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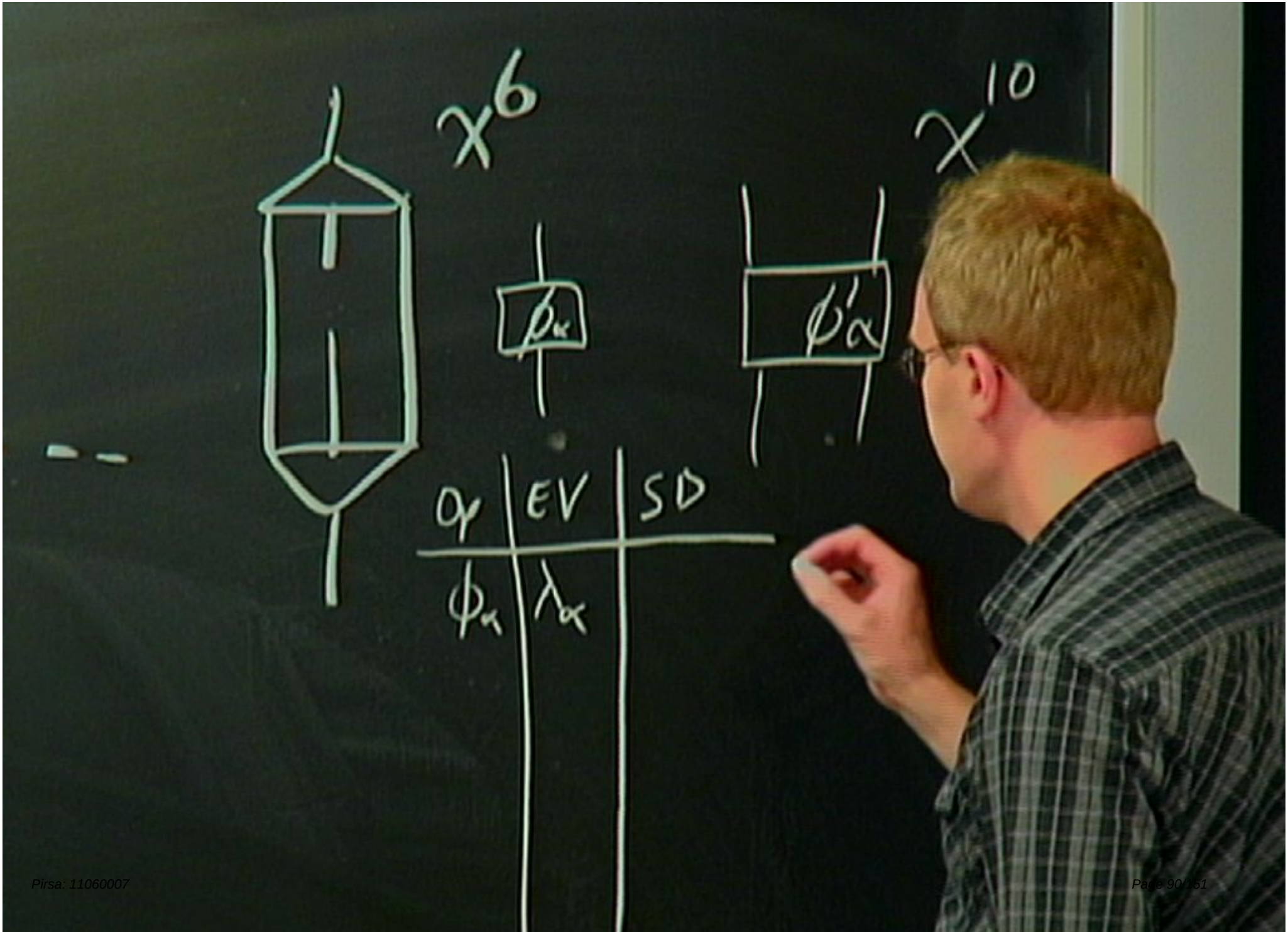
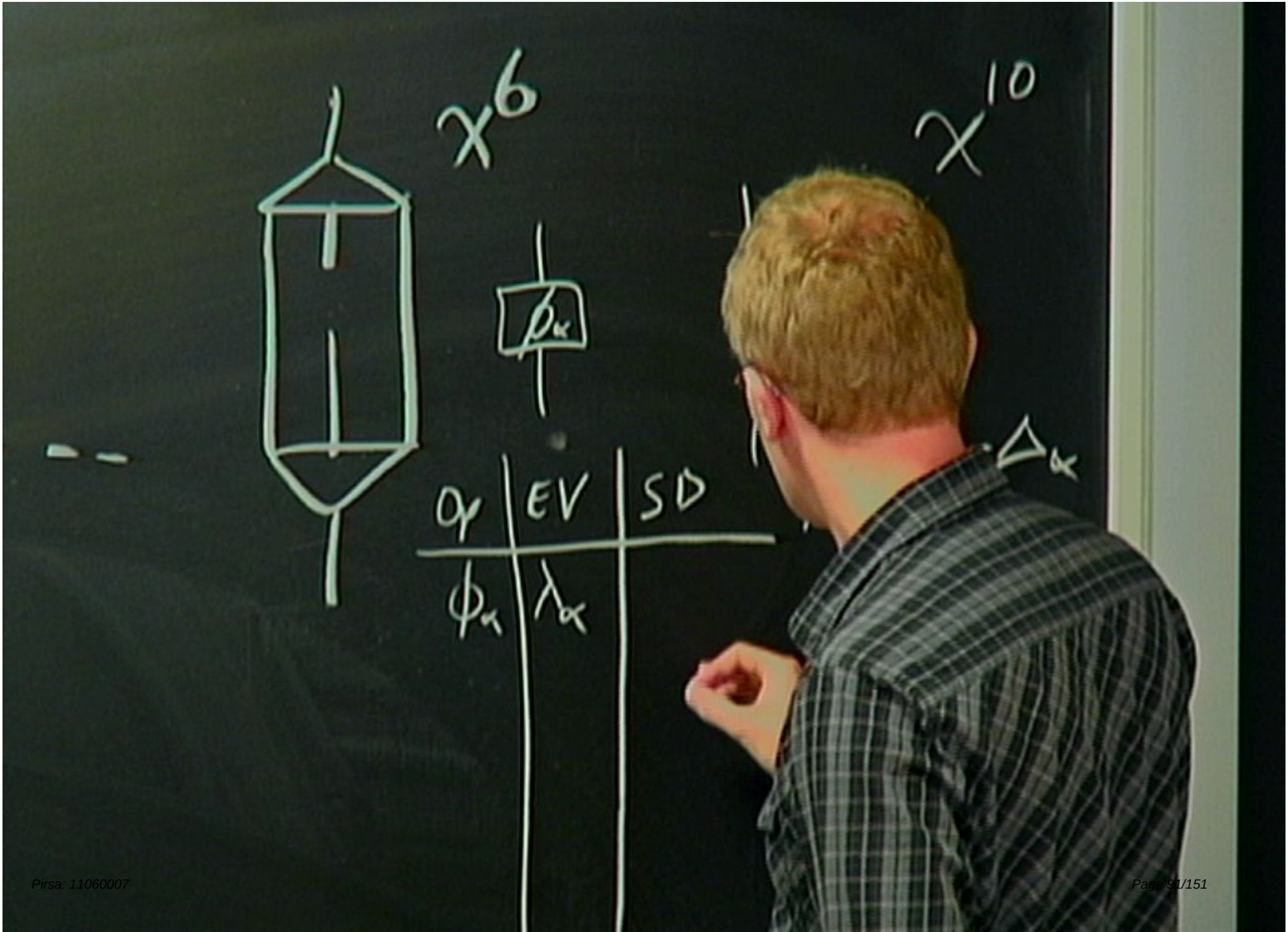
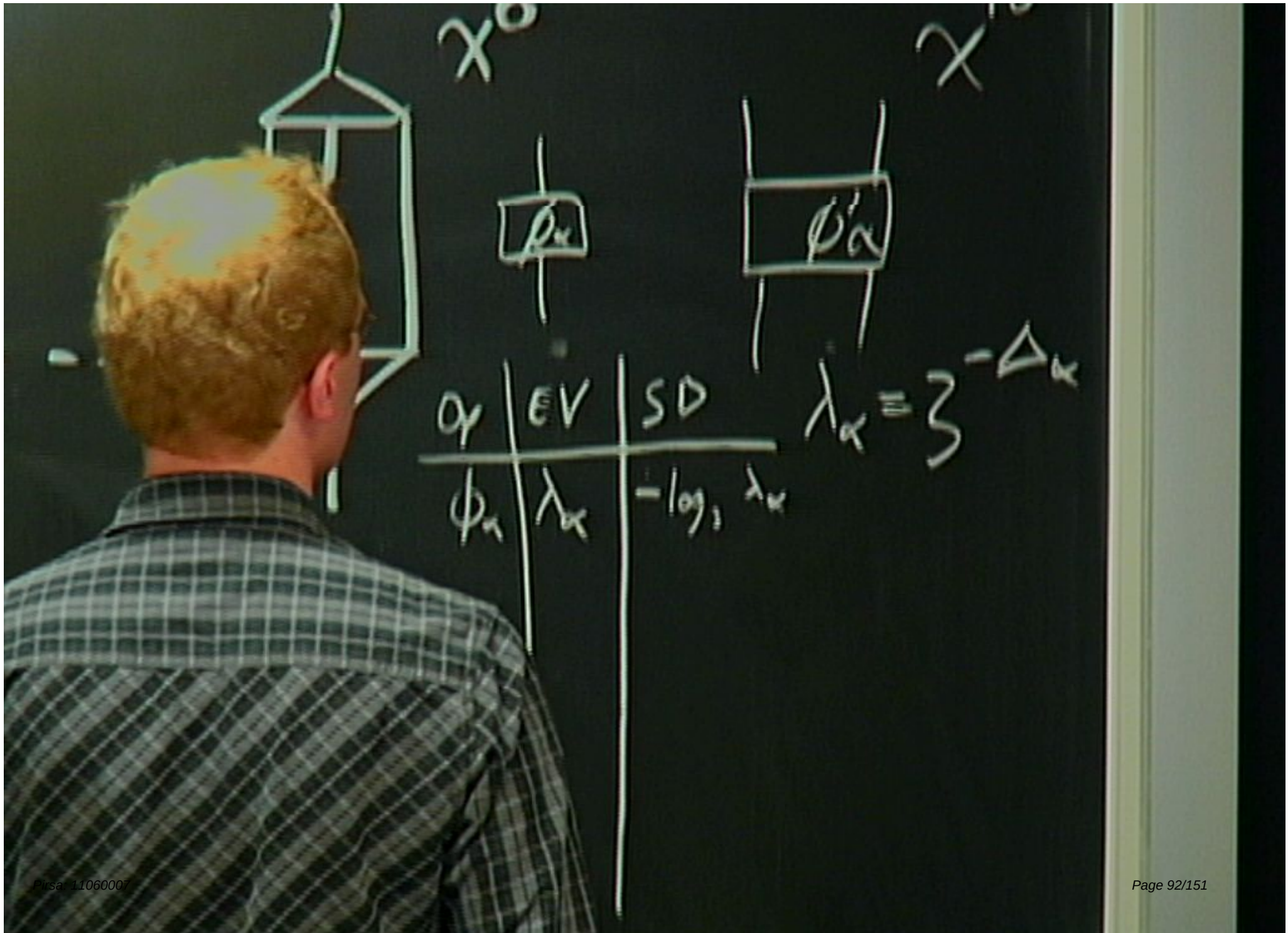
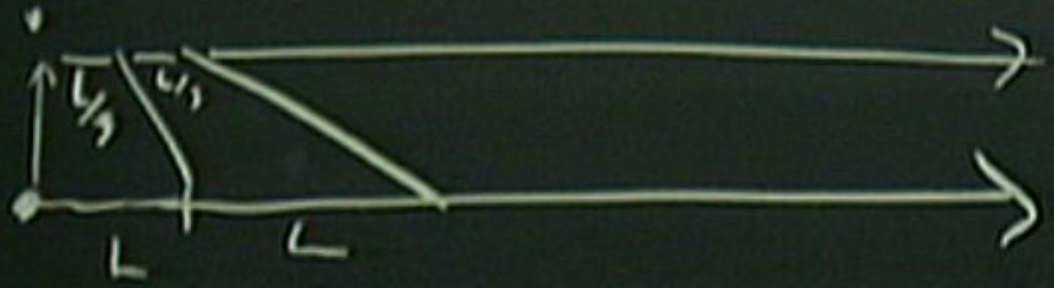

χ^6
χ^{10}
ϕ_α
ϕ'_α
Op | EV | SD
ϕ_α | λ_α


x^6
x^{10}
Φ_α
Δ_α
α | EV | SD
ϕ_α | λ_α



χ^0
χ^1
ϕ_α
ϕ'_α
Op | EV | SD
ϕ_α | λ_α | $-\log_3 \lambda_\alpha$
$\lambda_\alpha \equiv 3^{-\Delta_\alpha}$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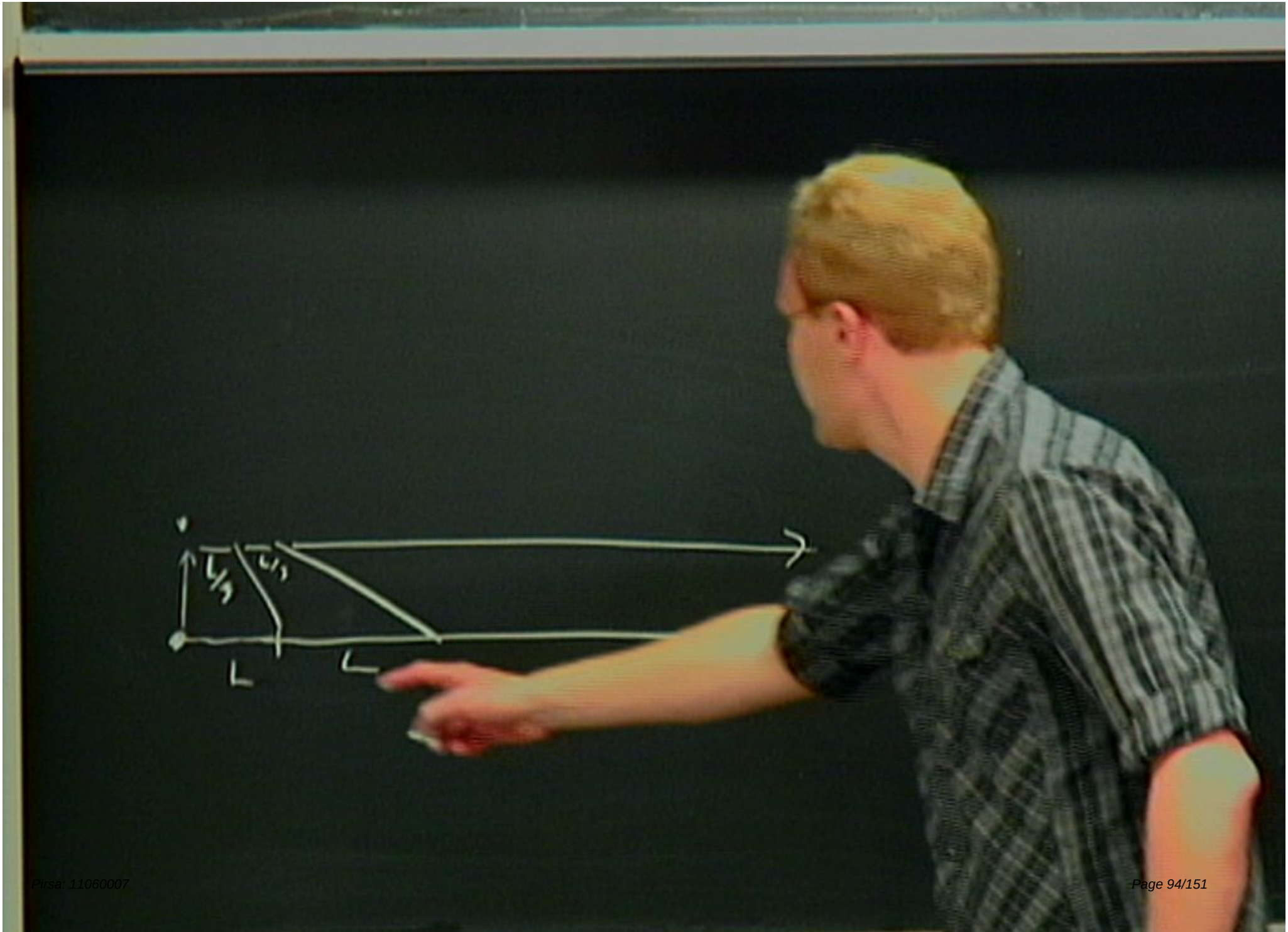
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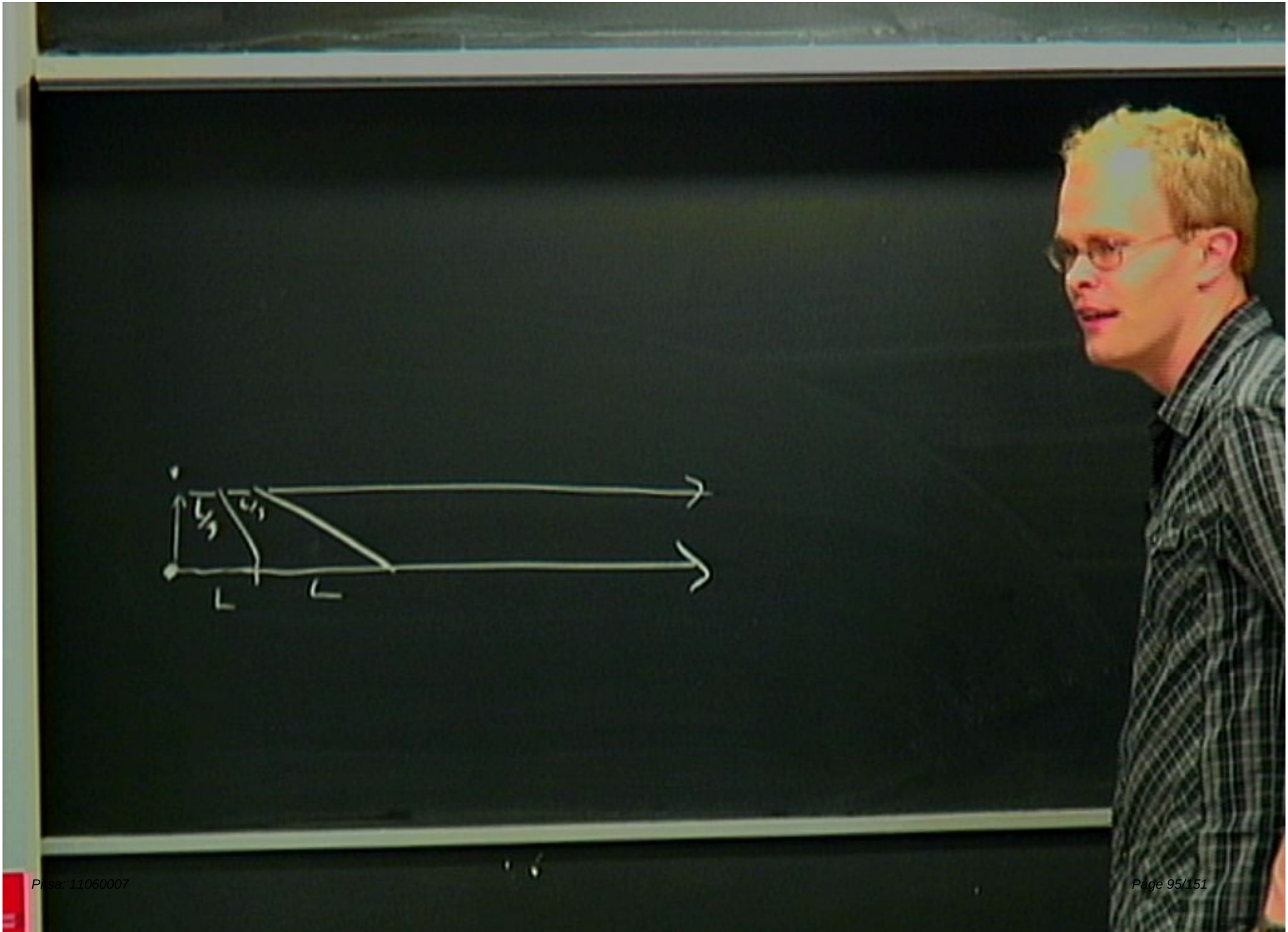
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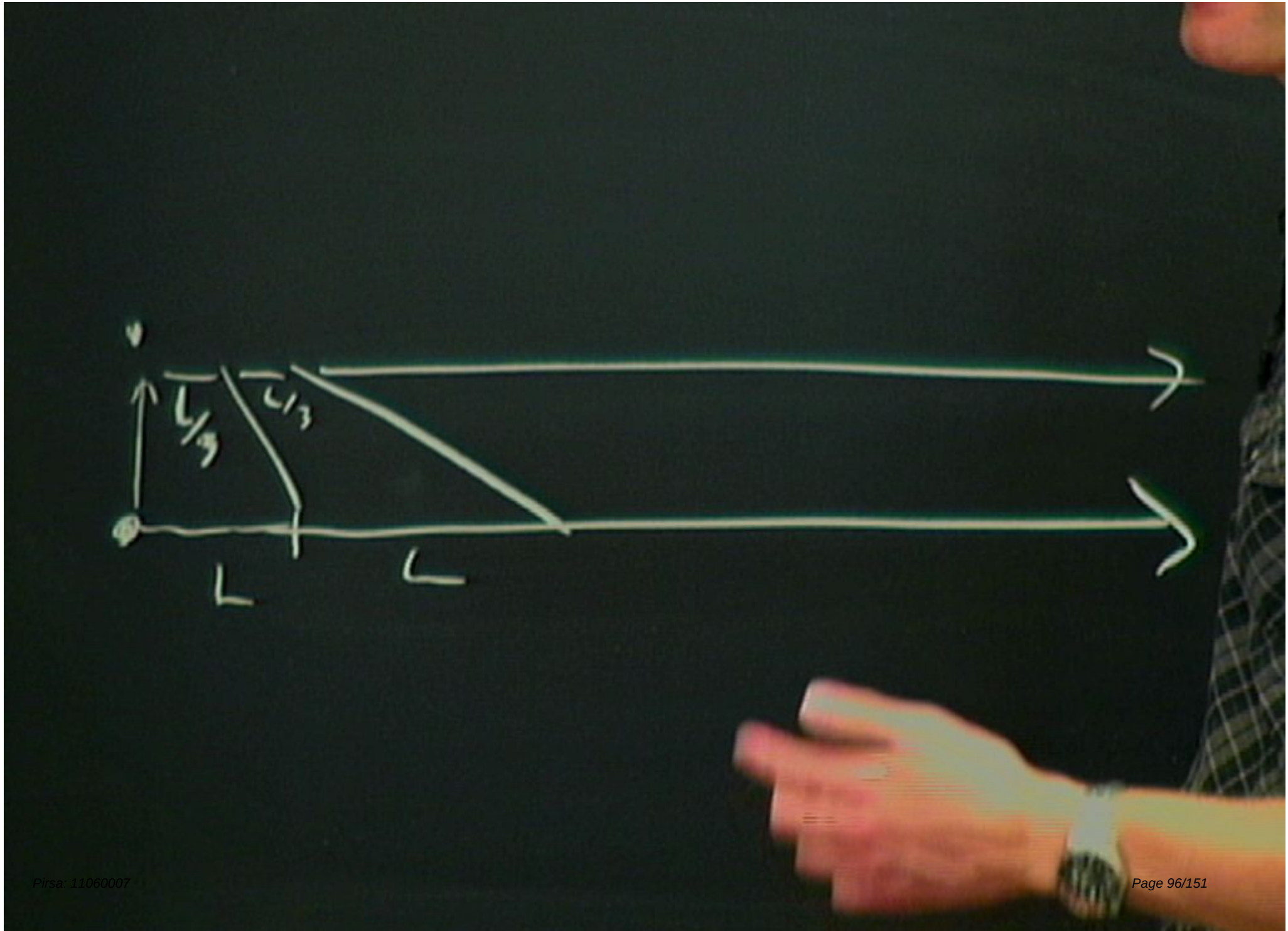
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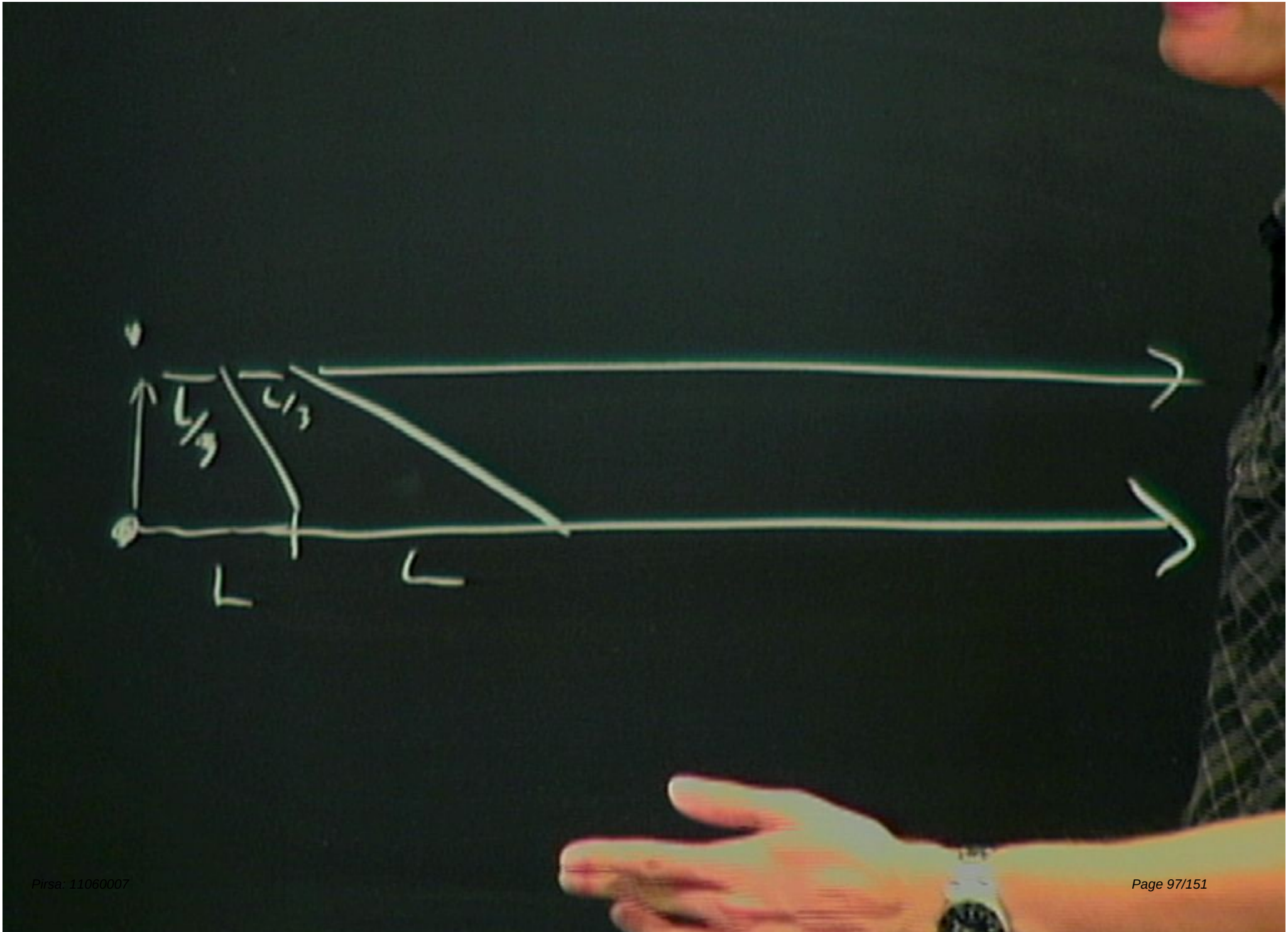
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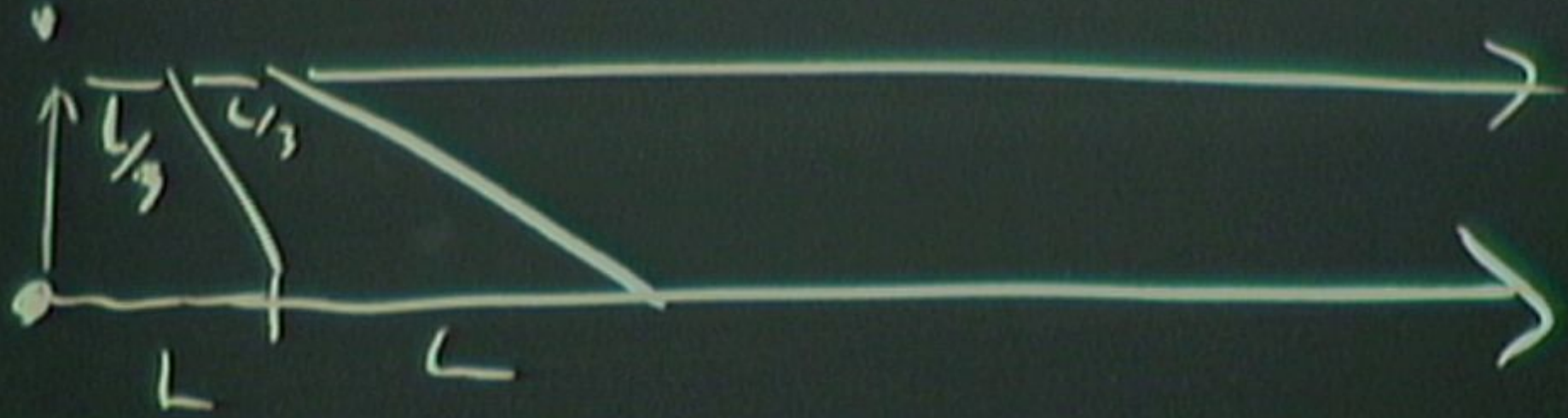
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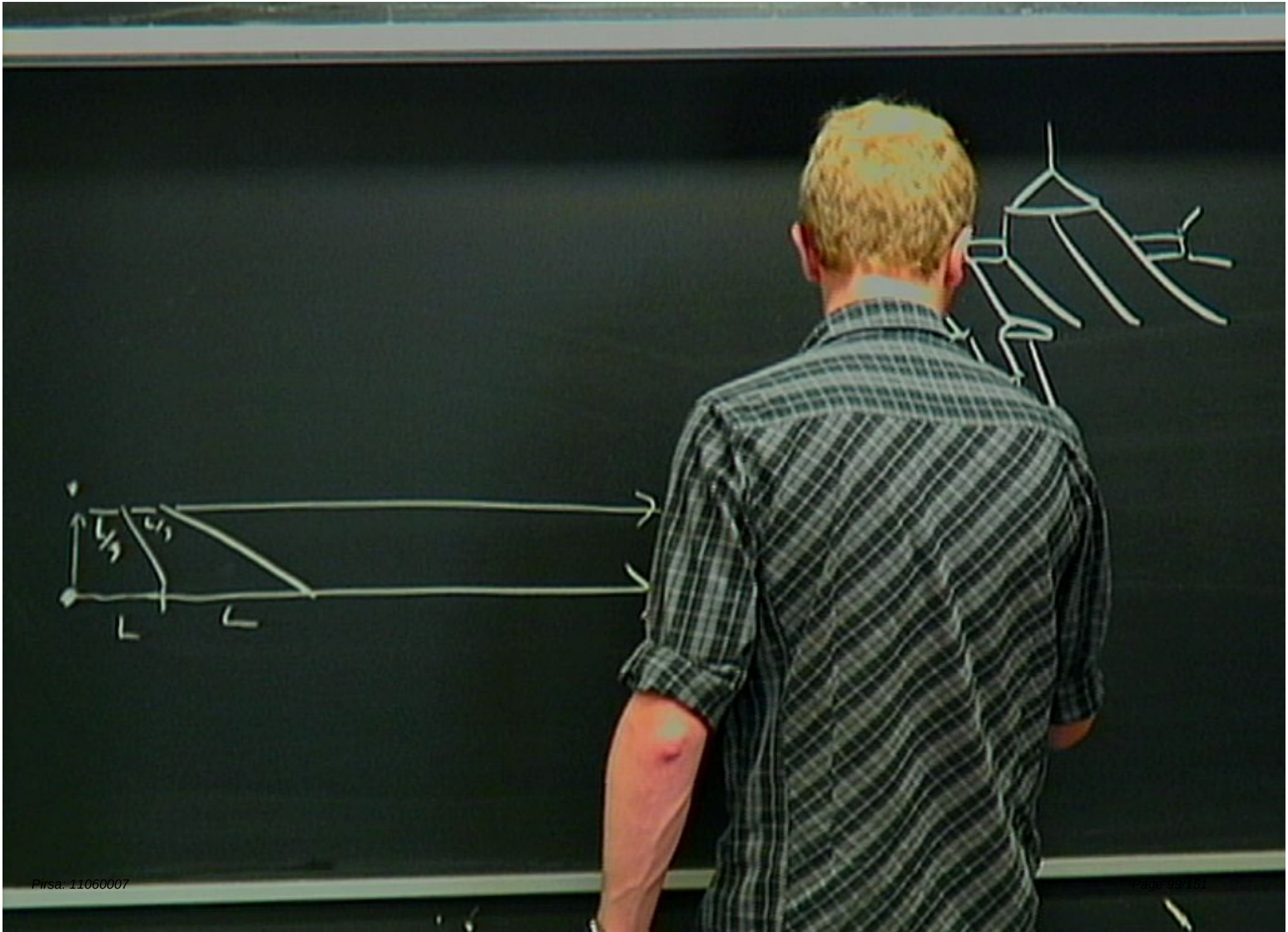
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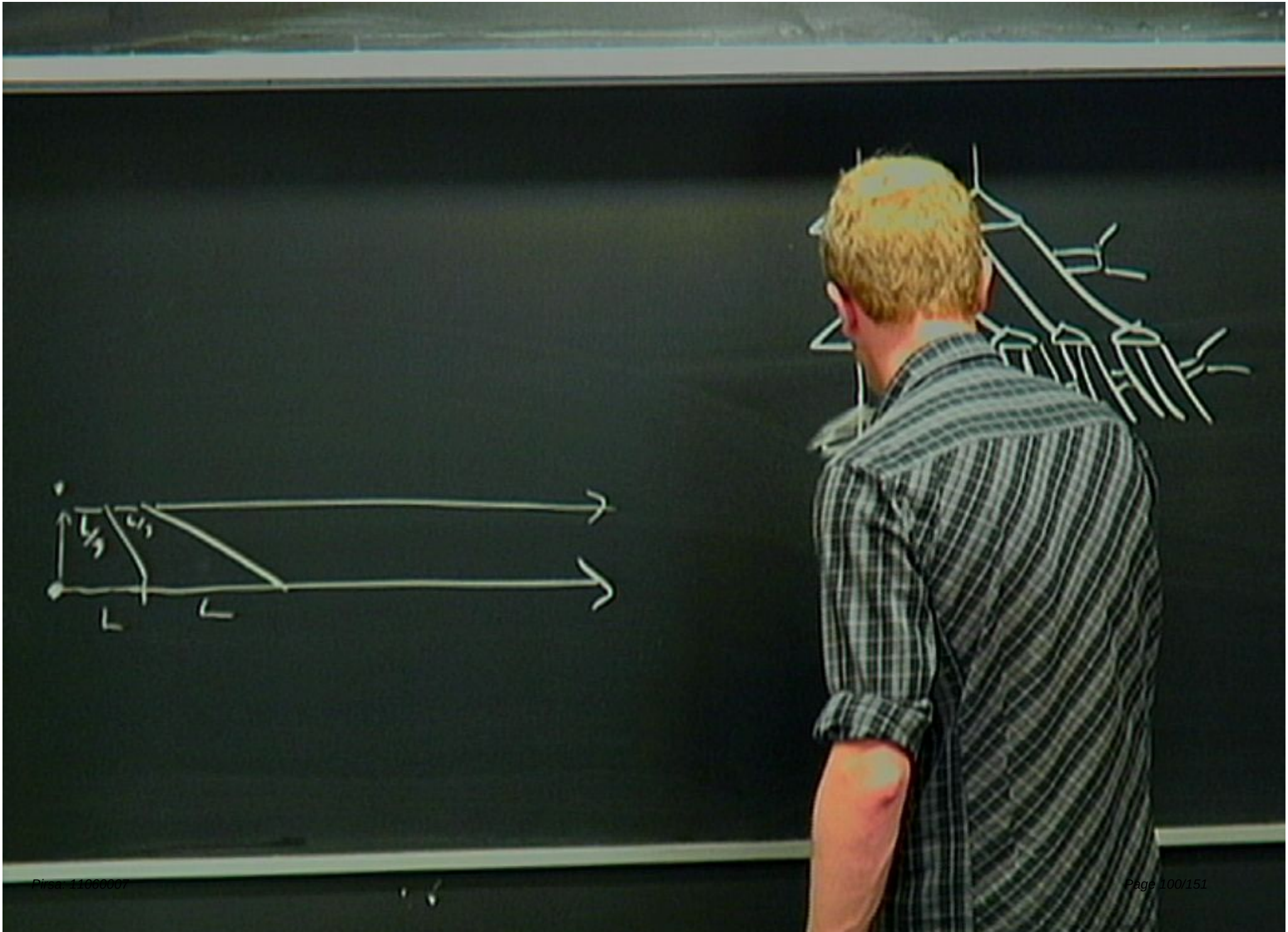
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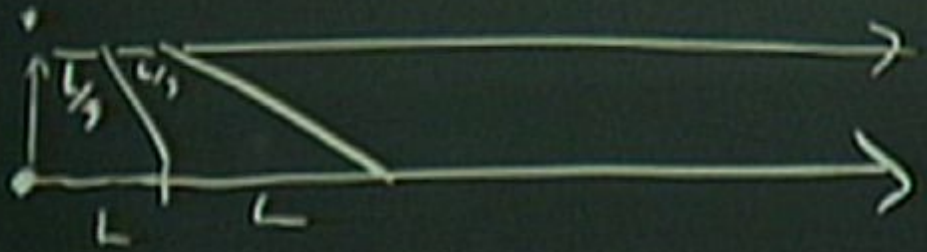
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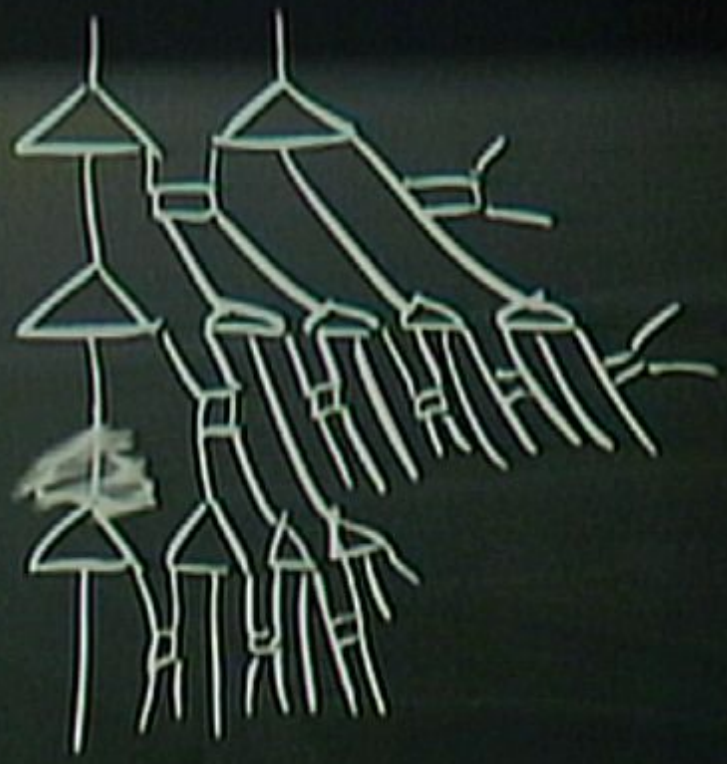

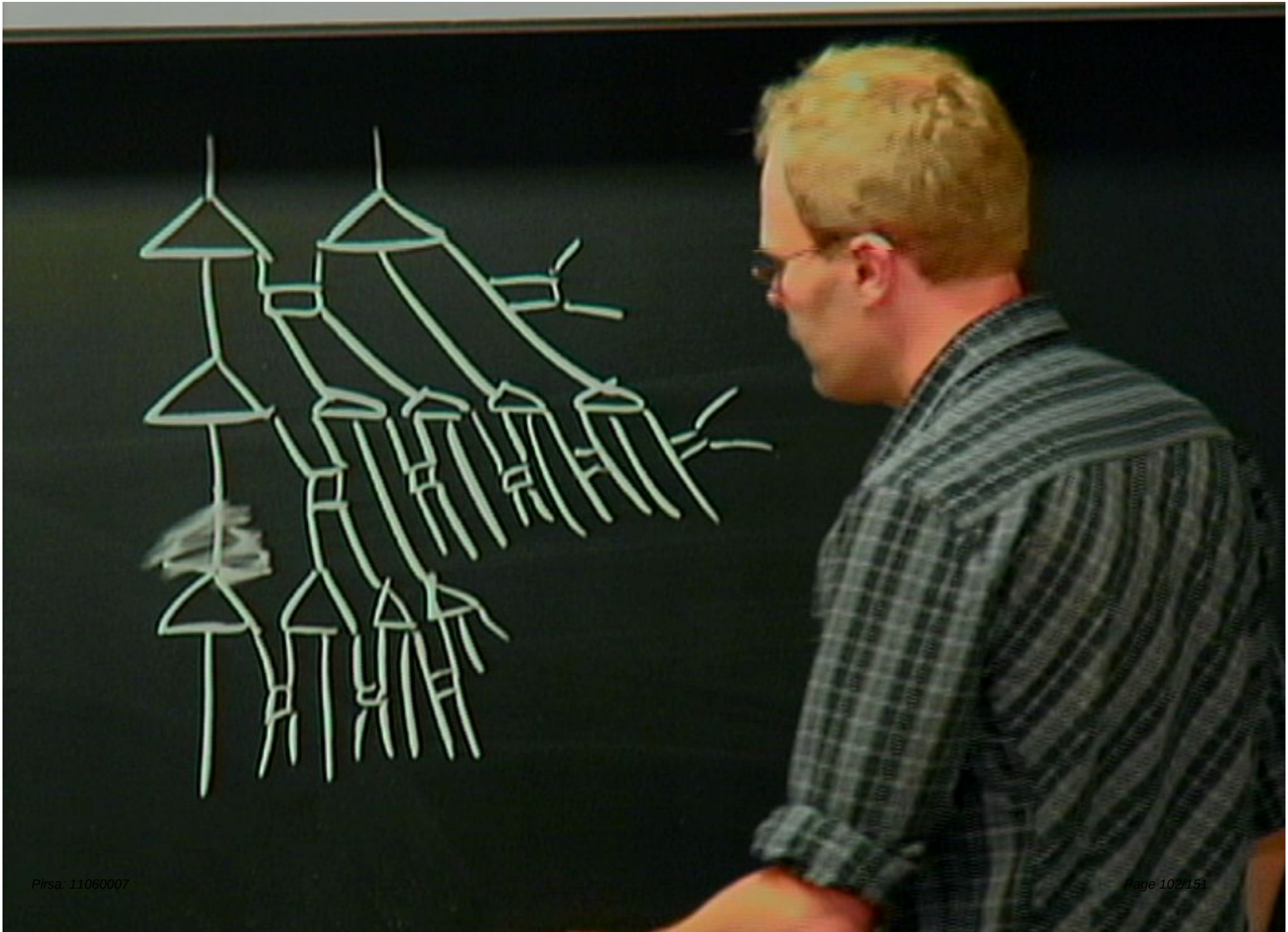

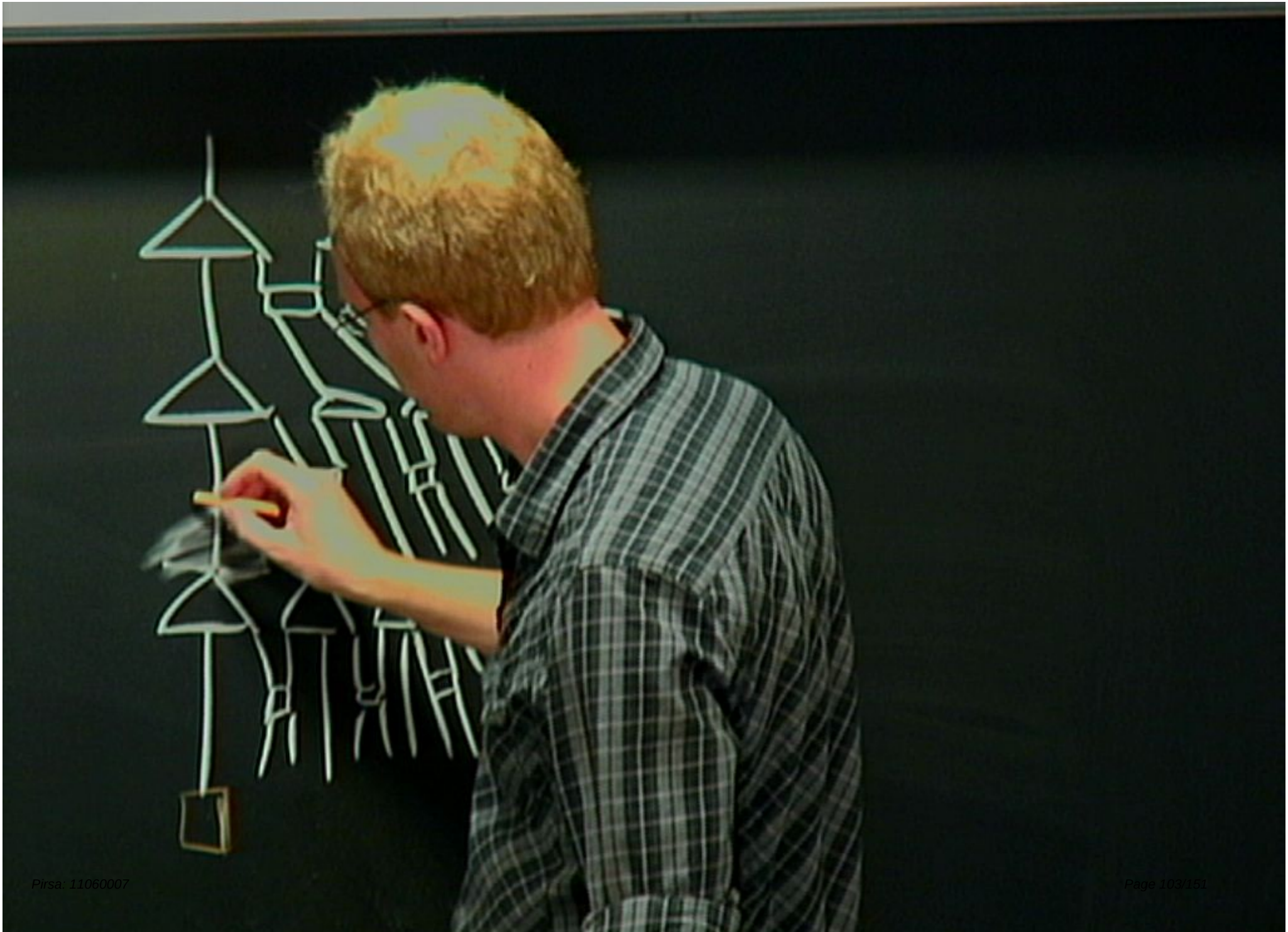

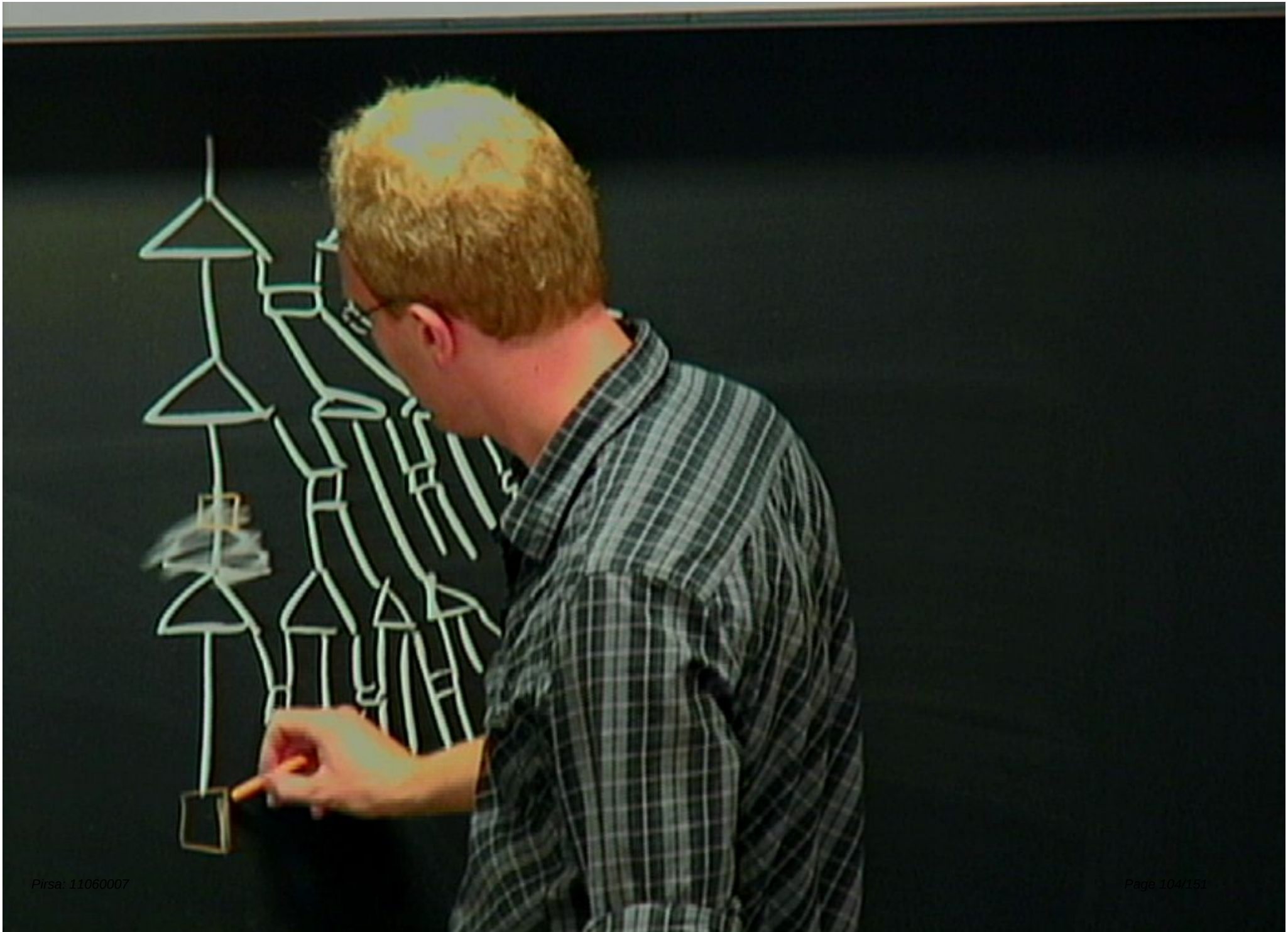

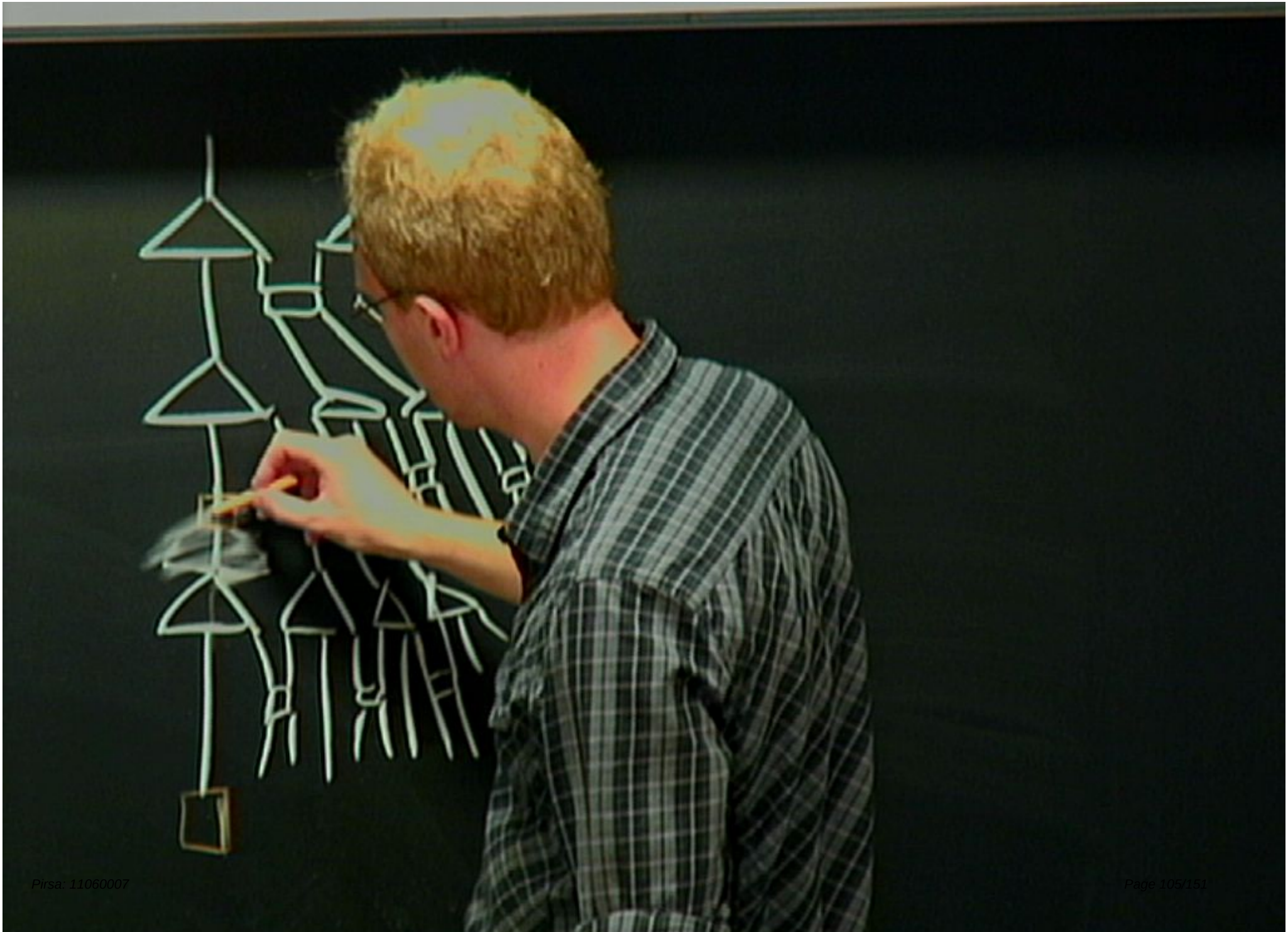

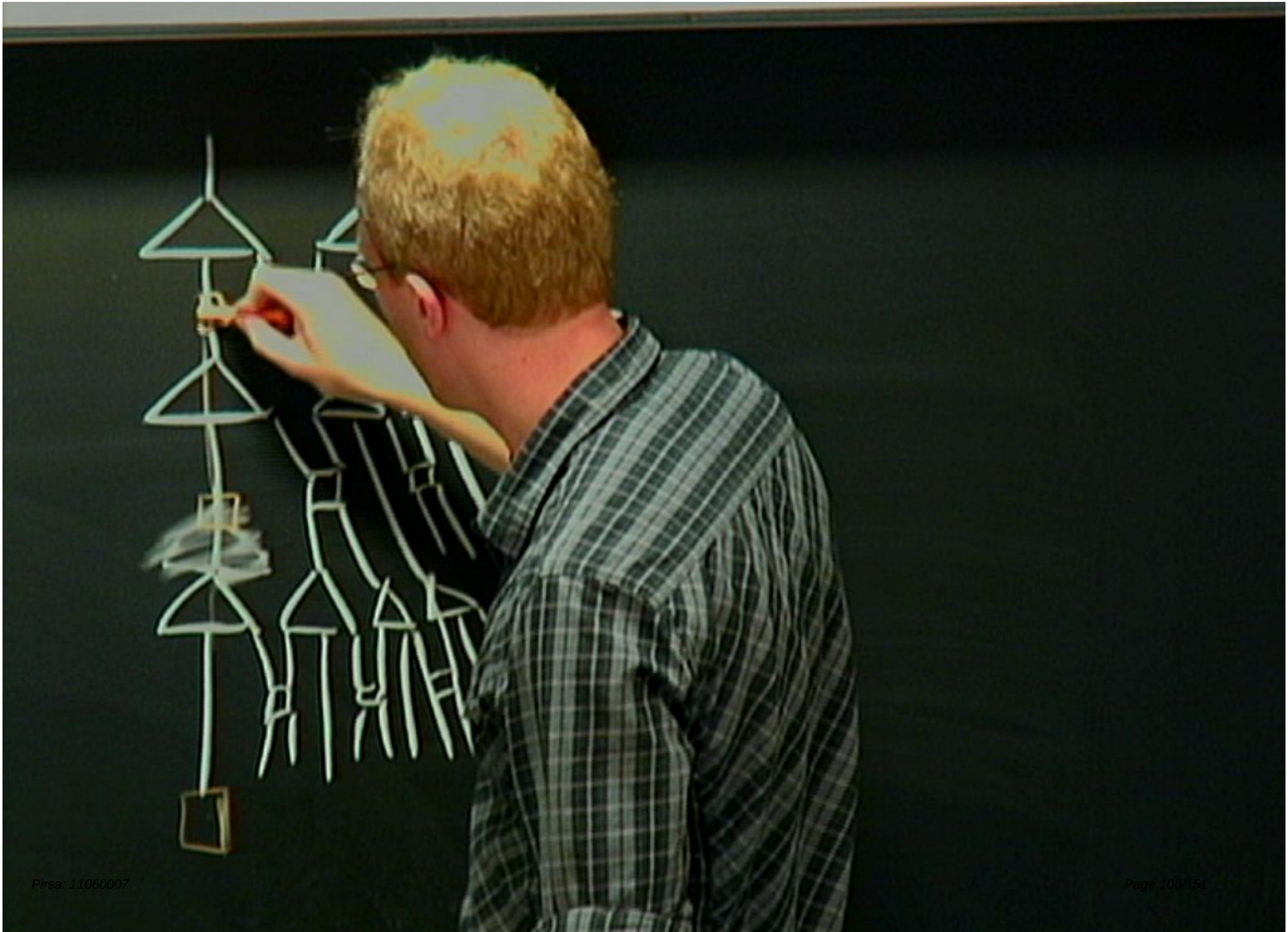

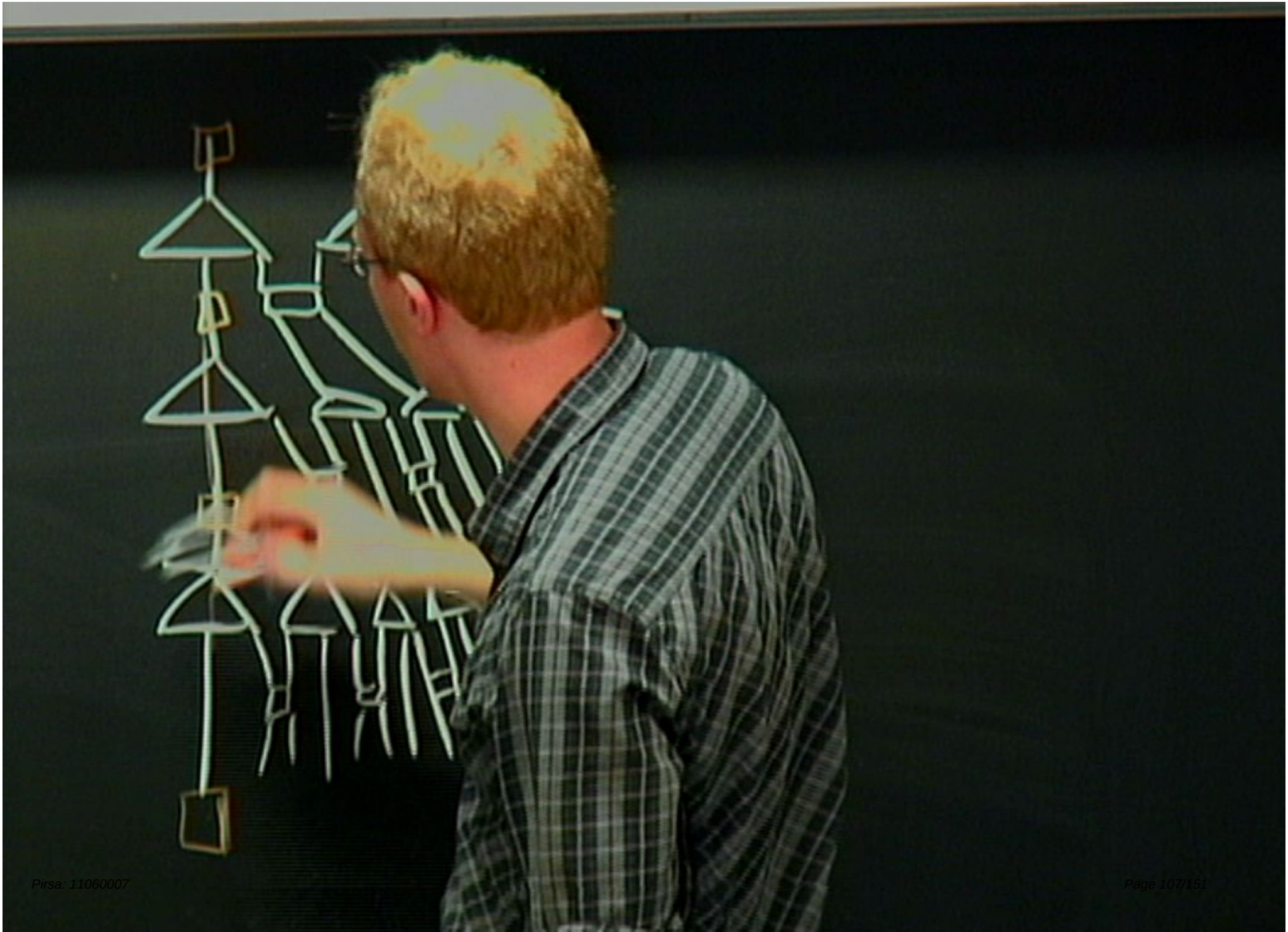

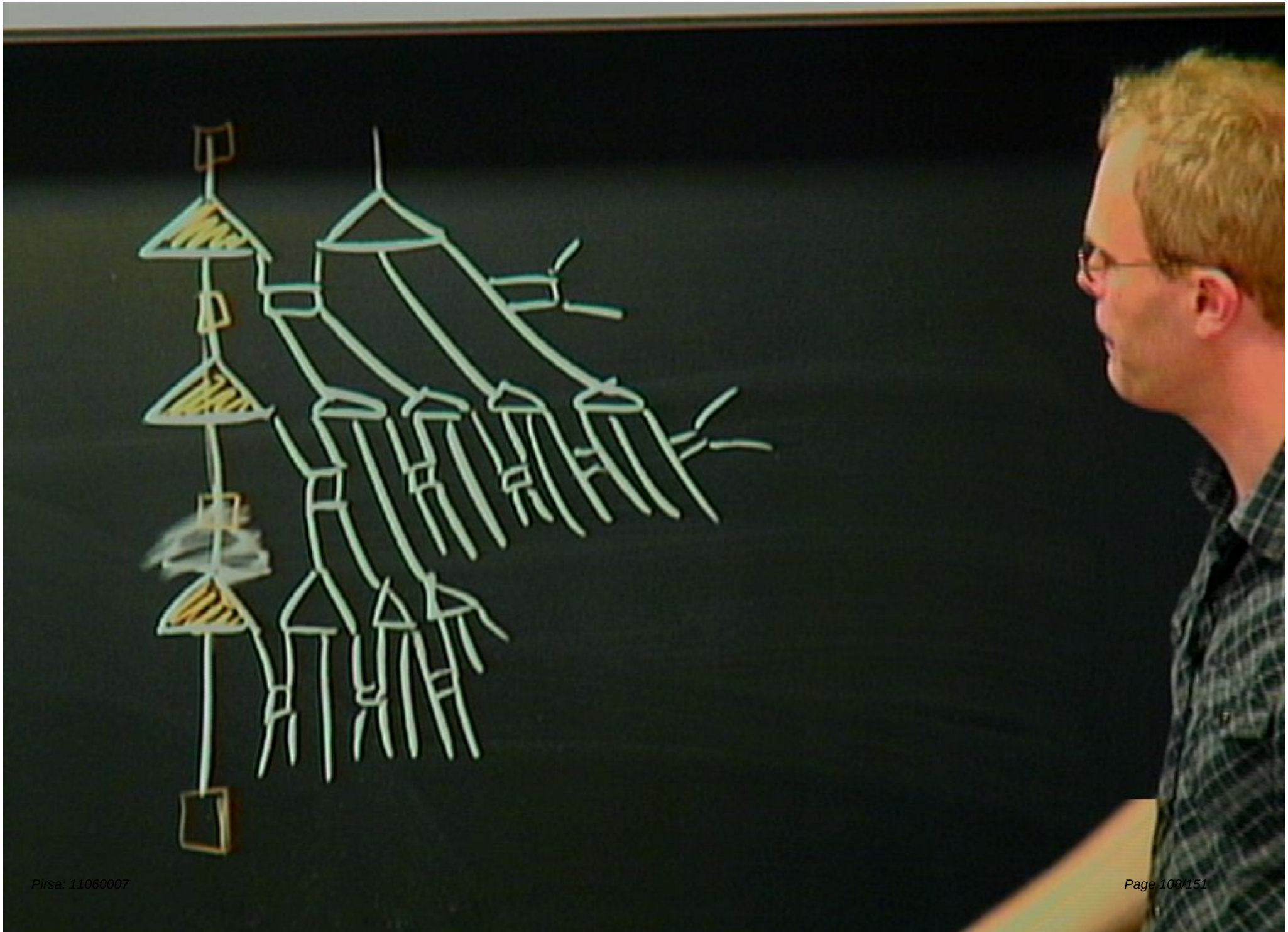

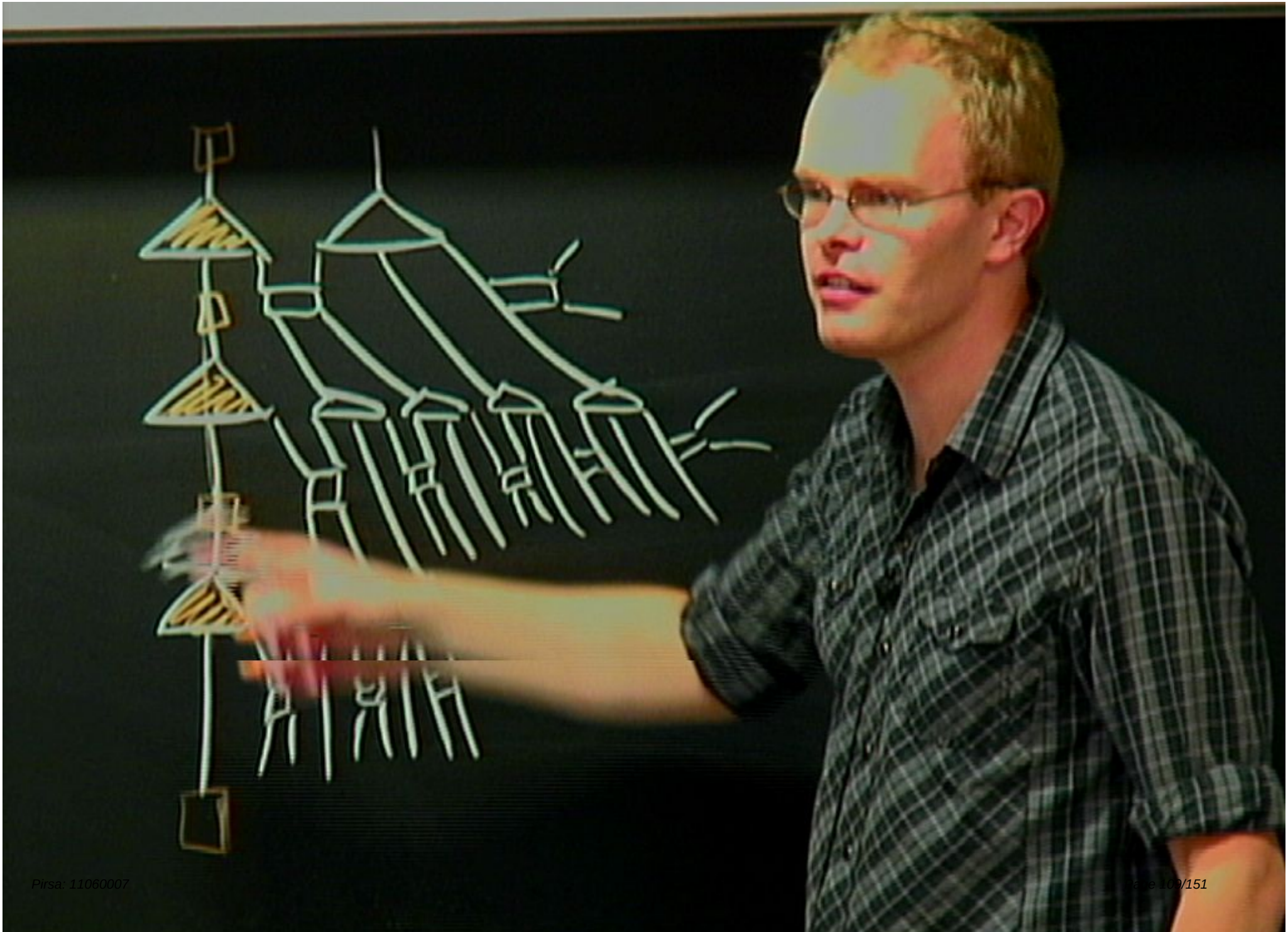

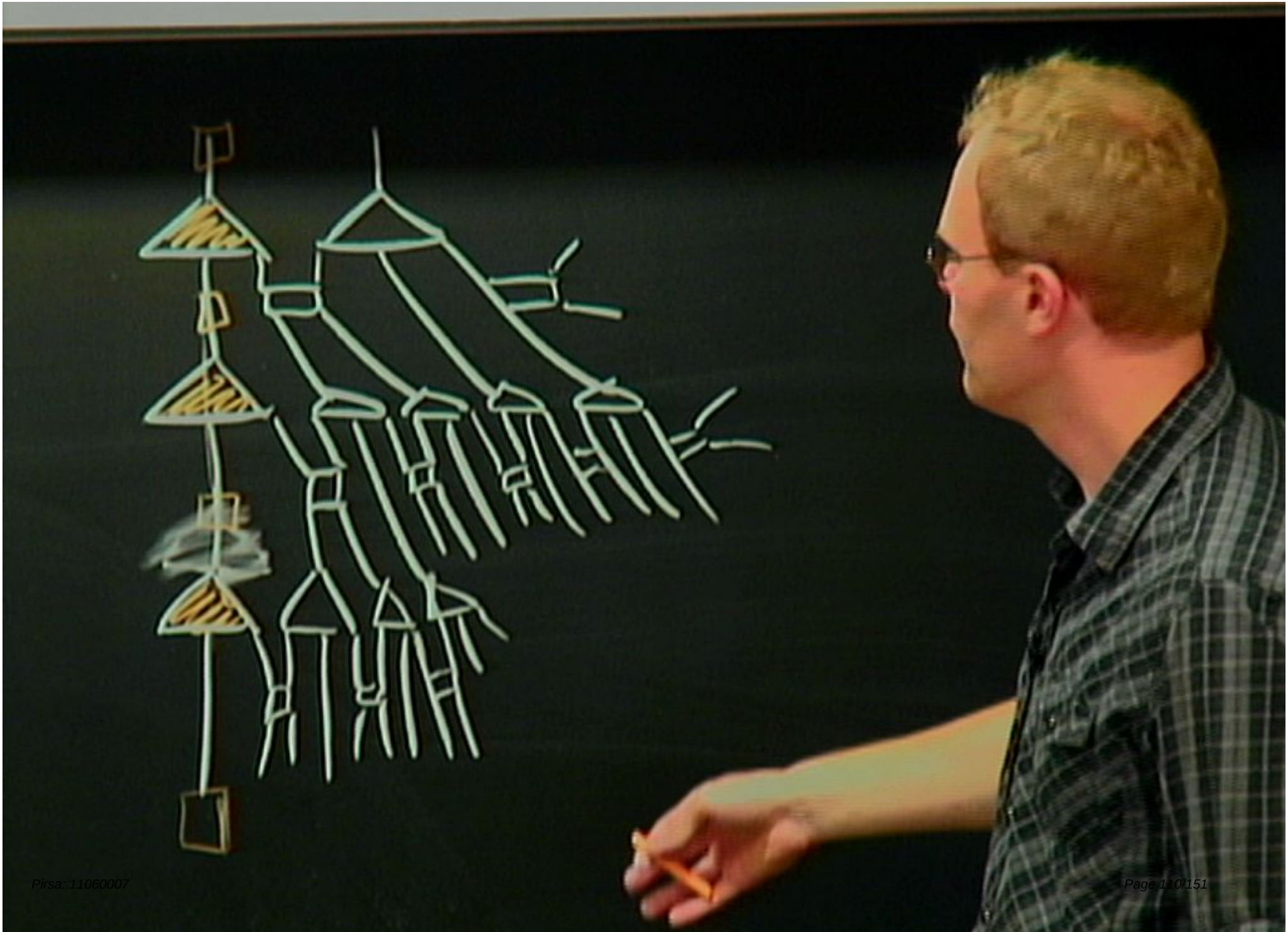

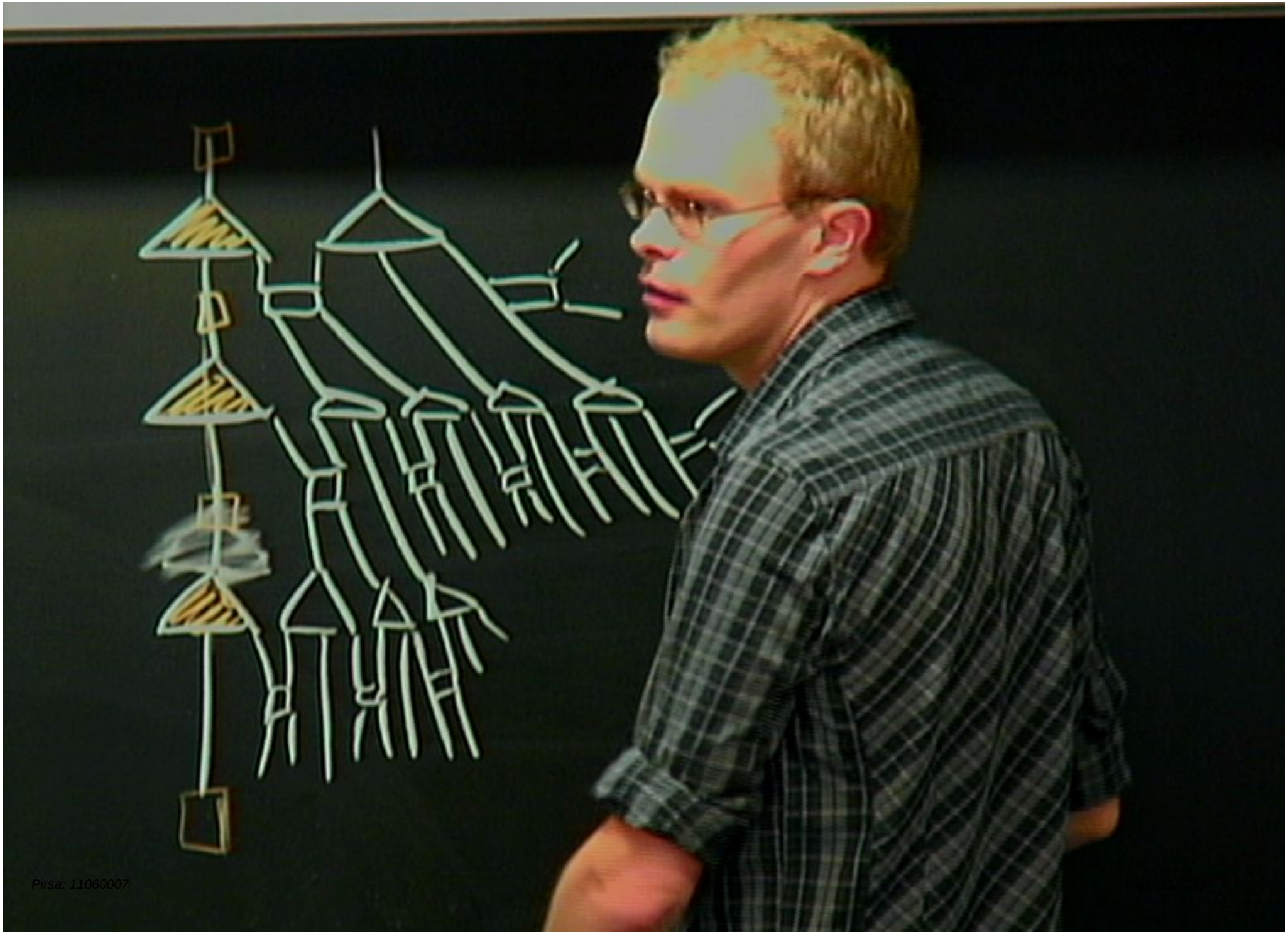

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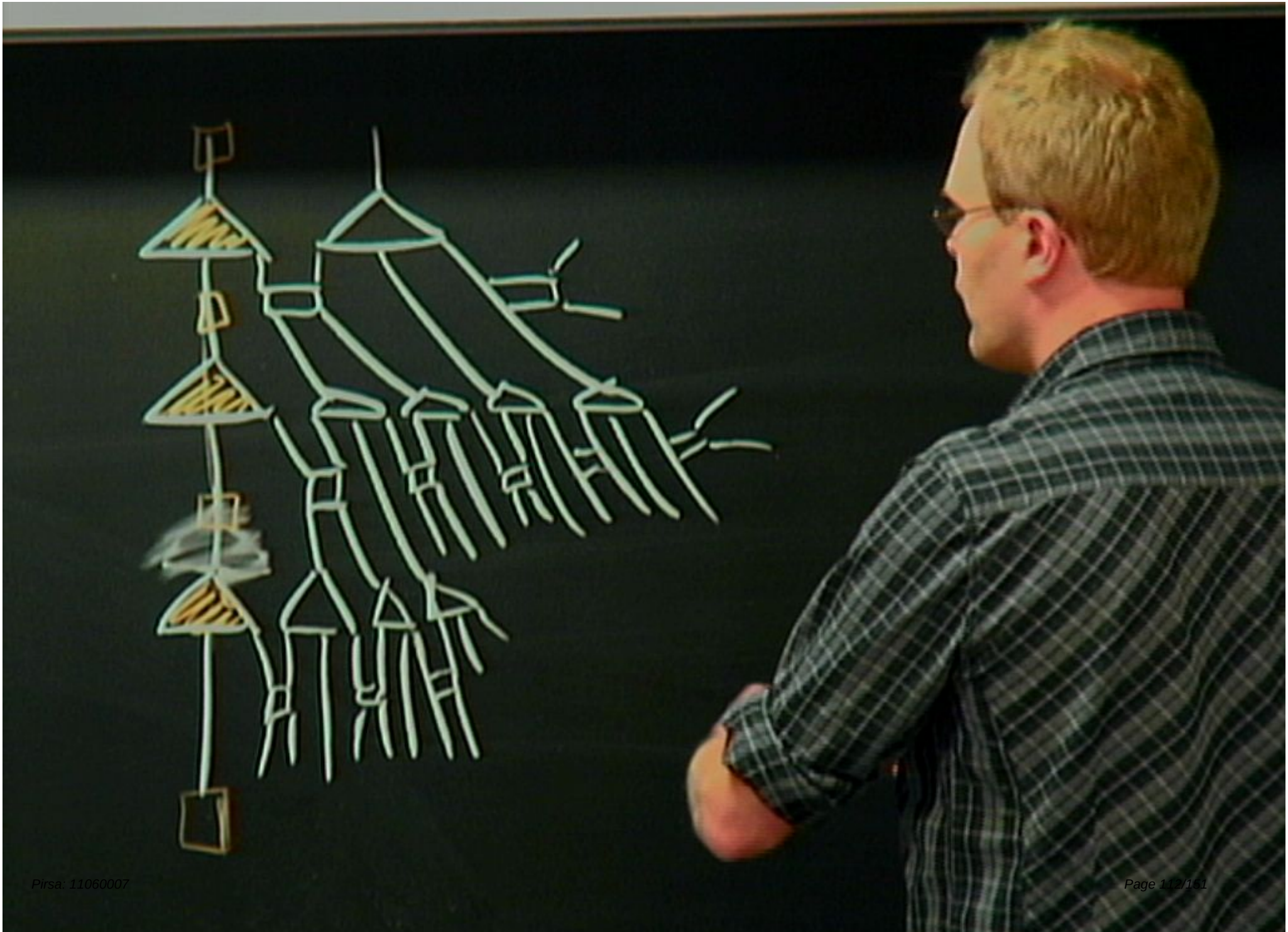

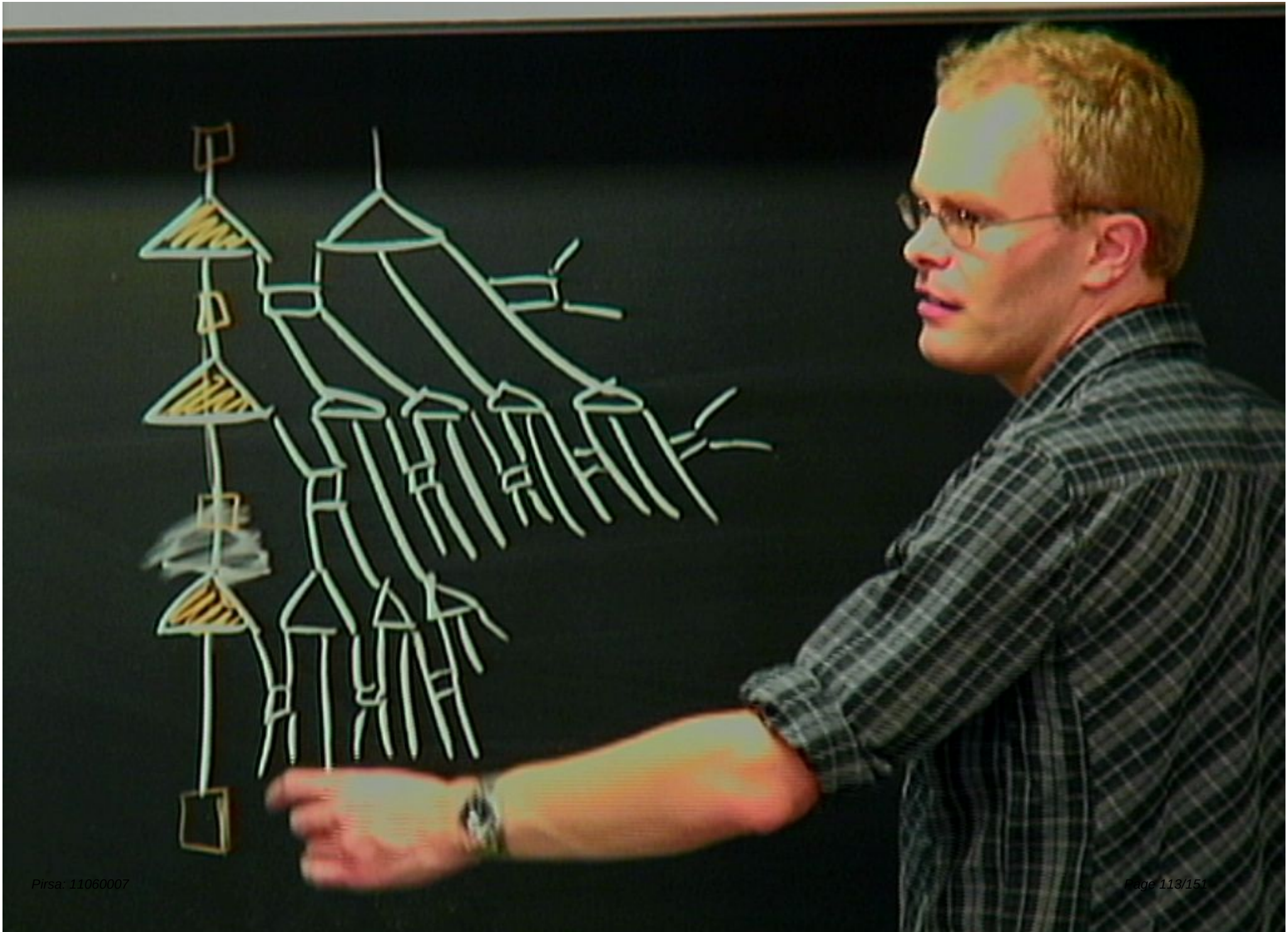

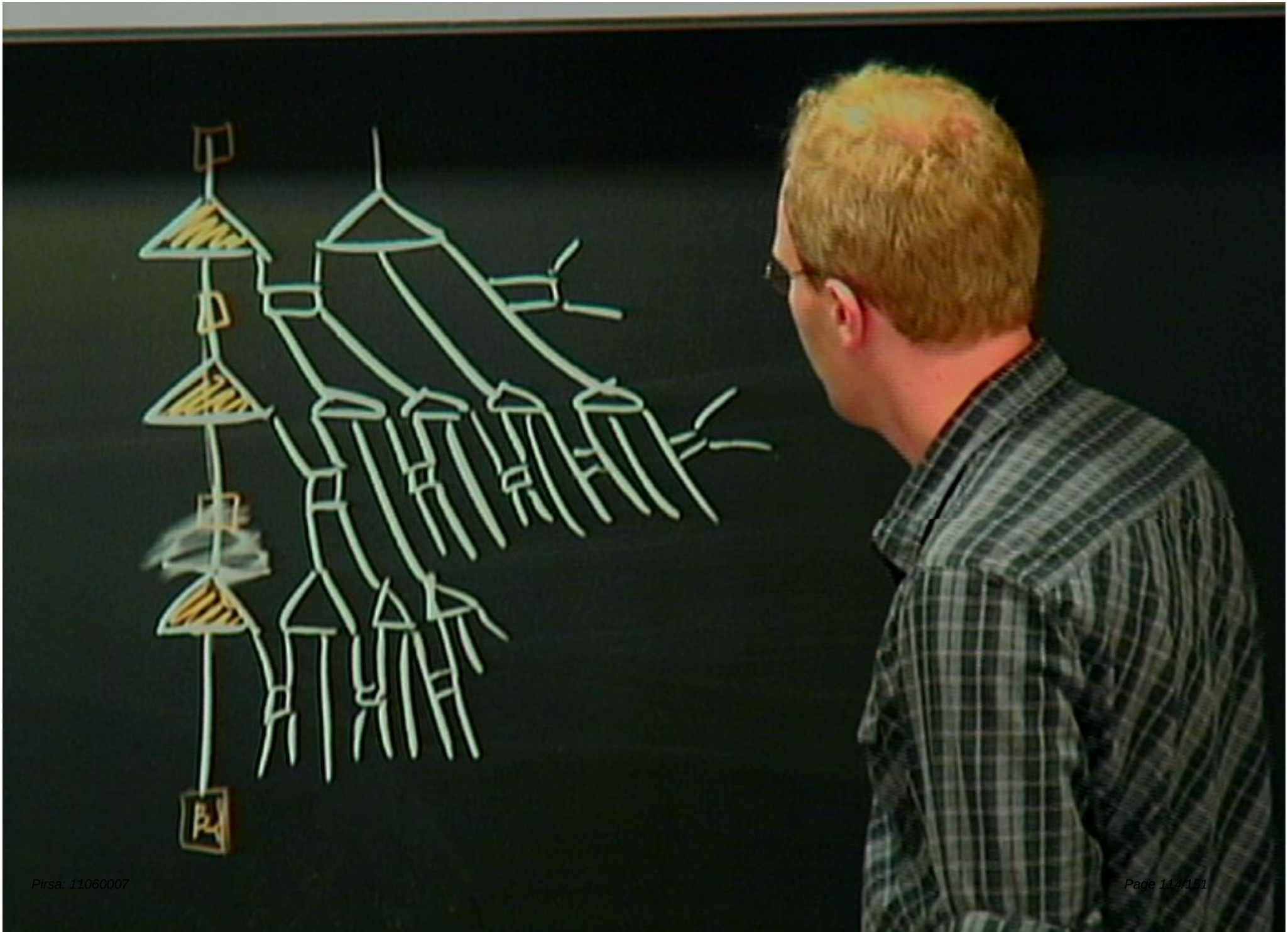

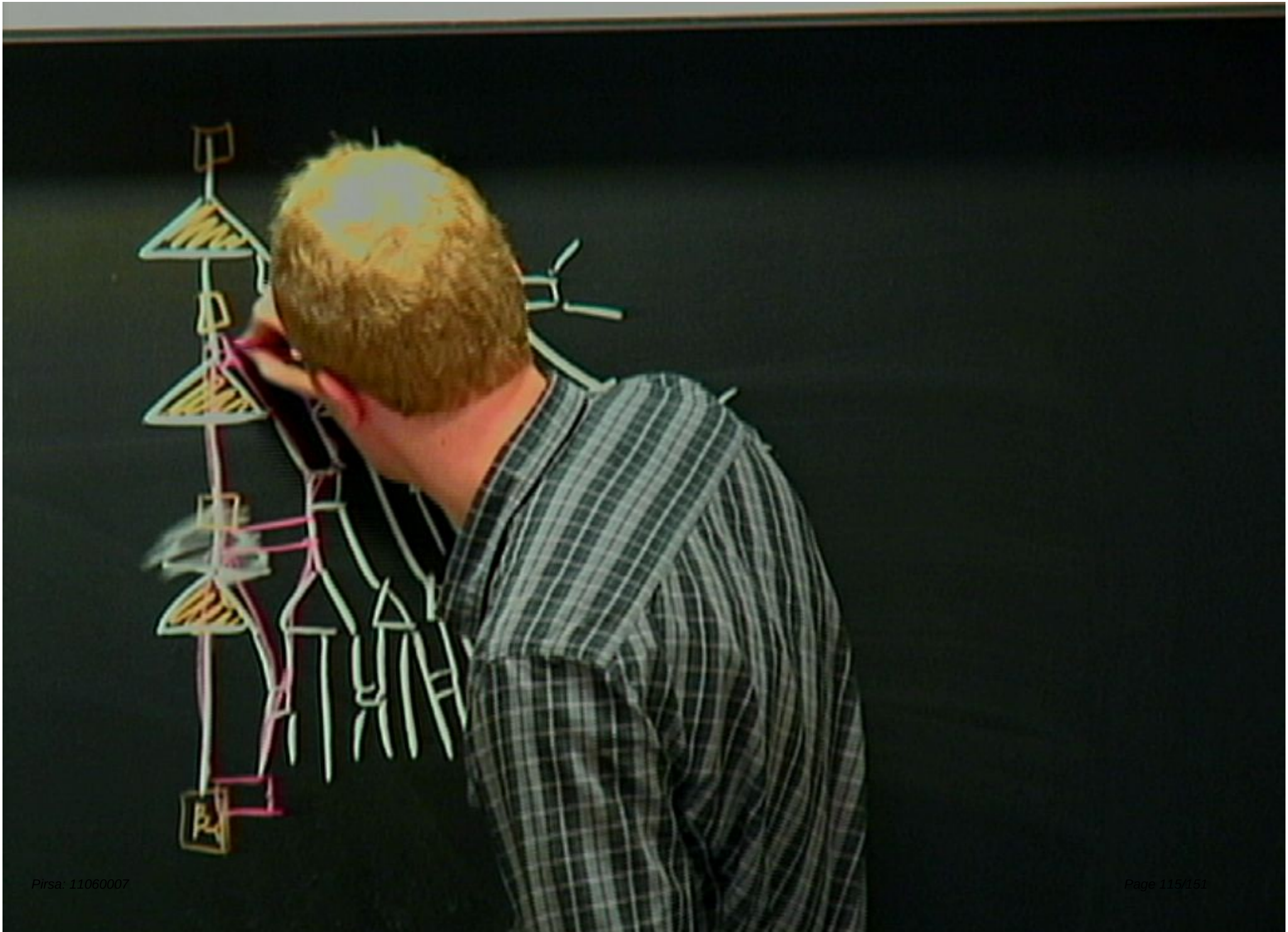

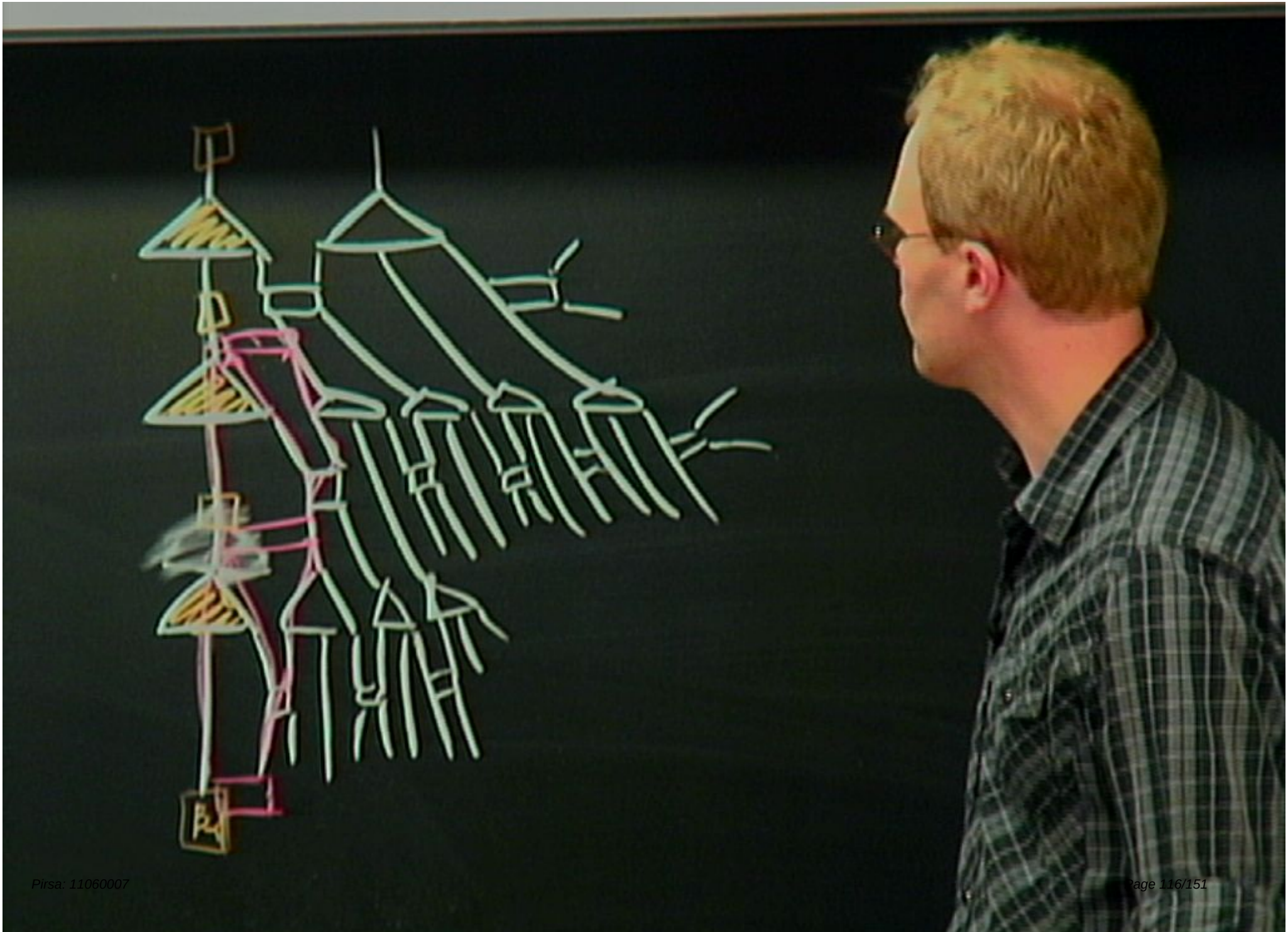

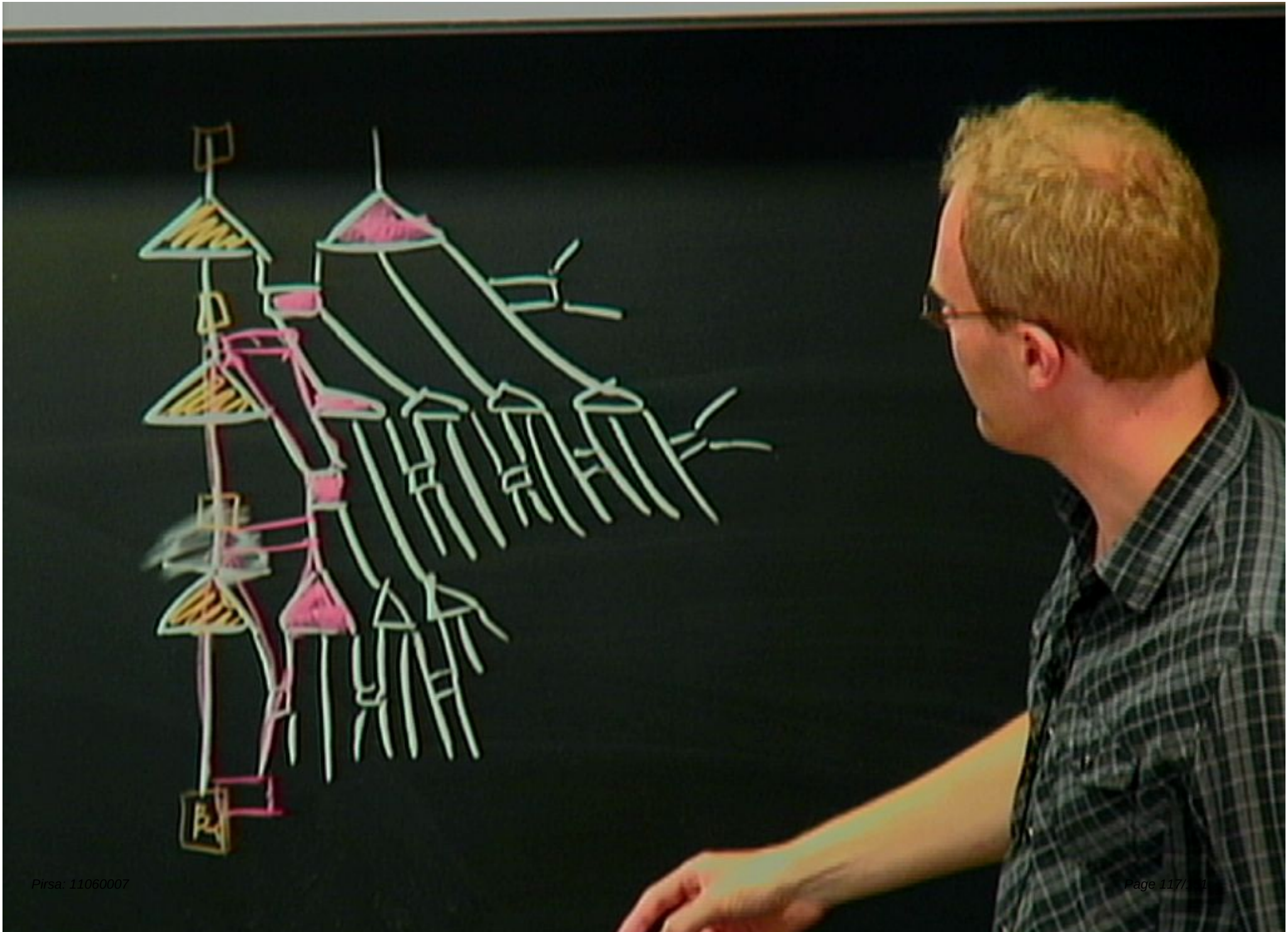

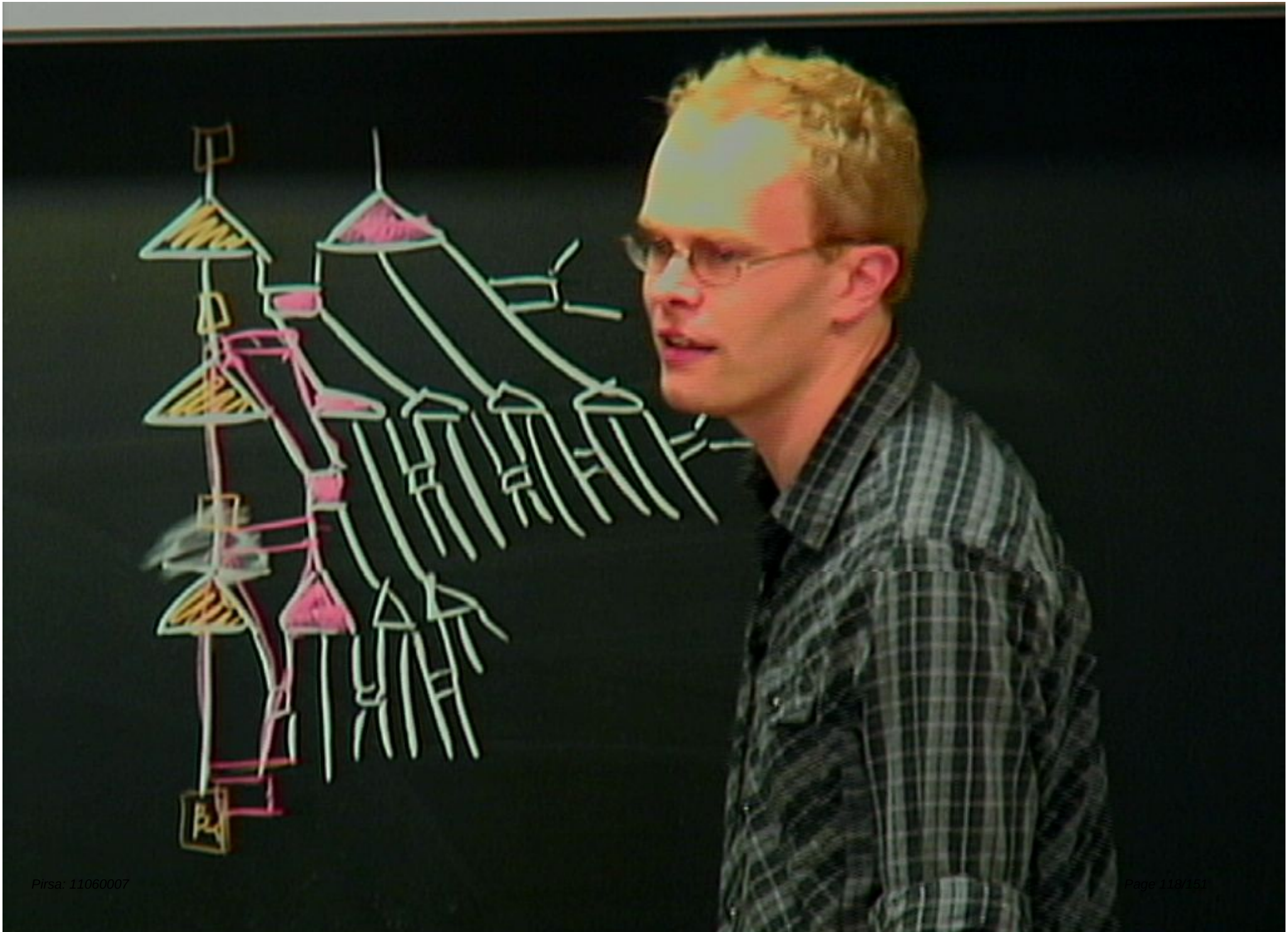

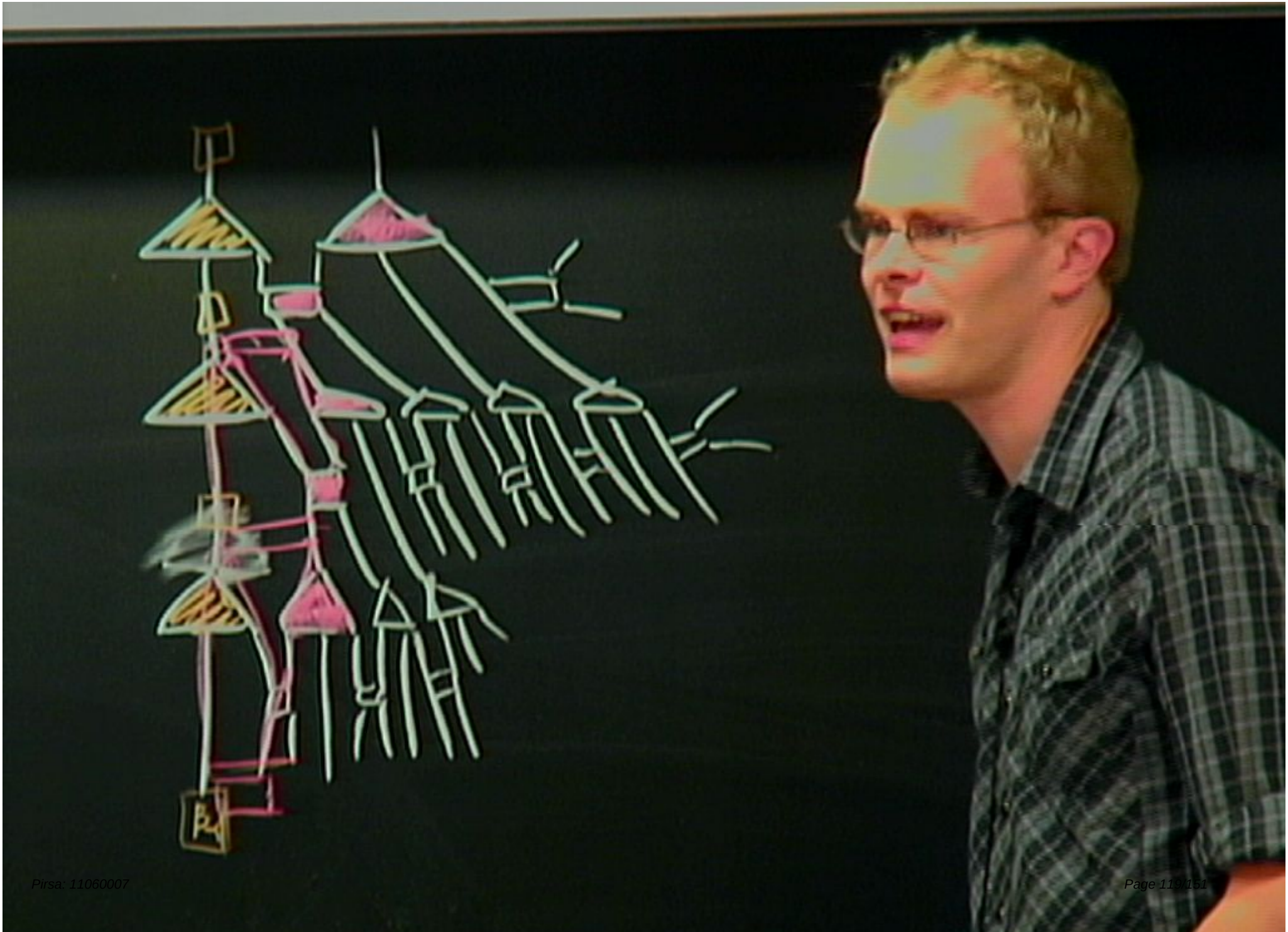

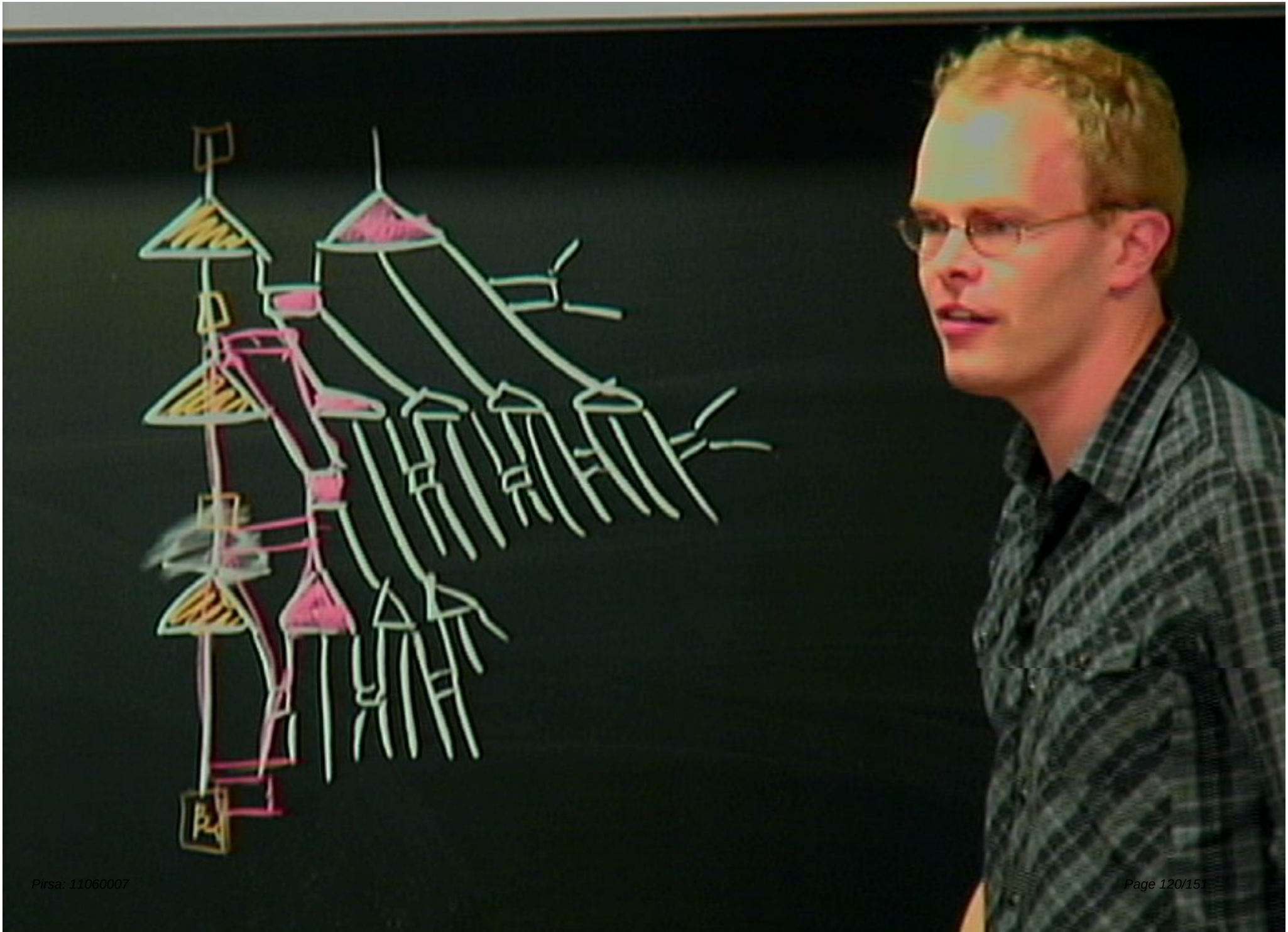

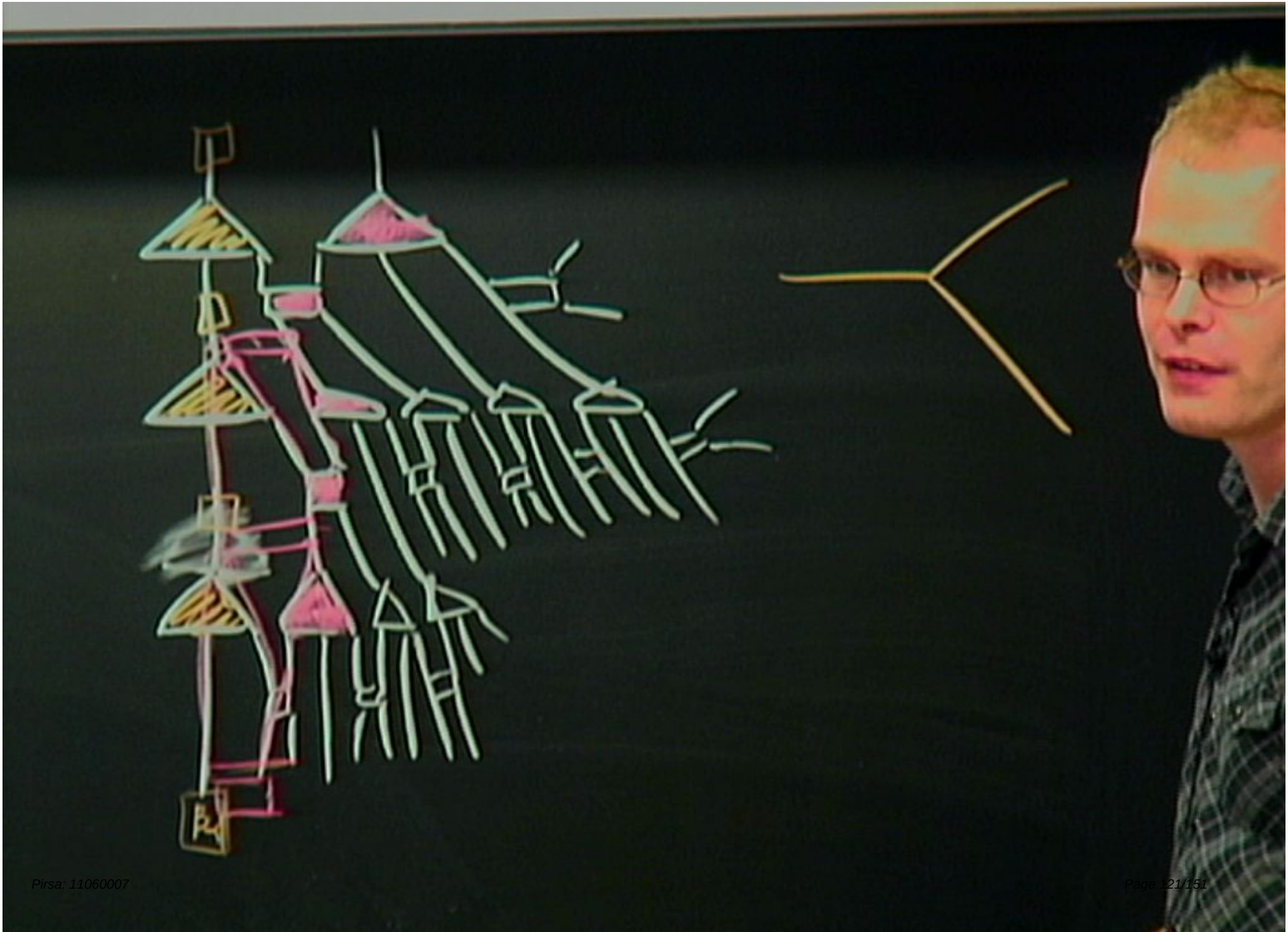

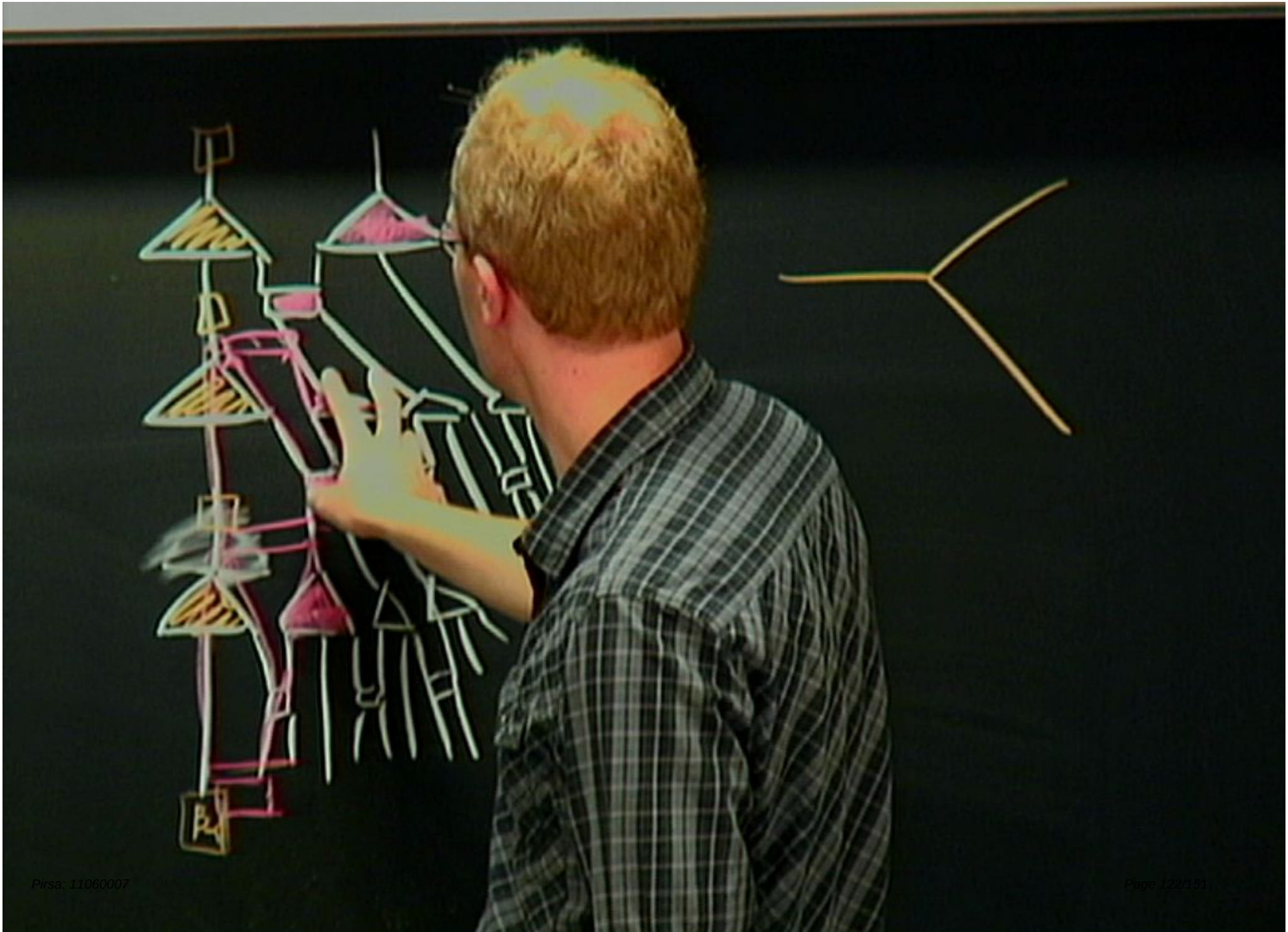

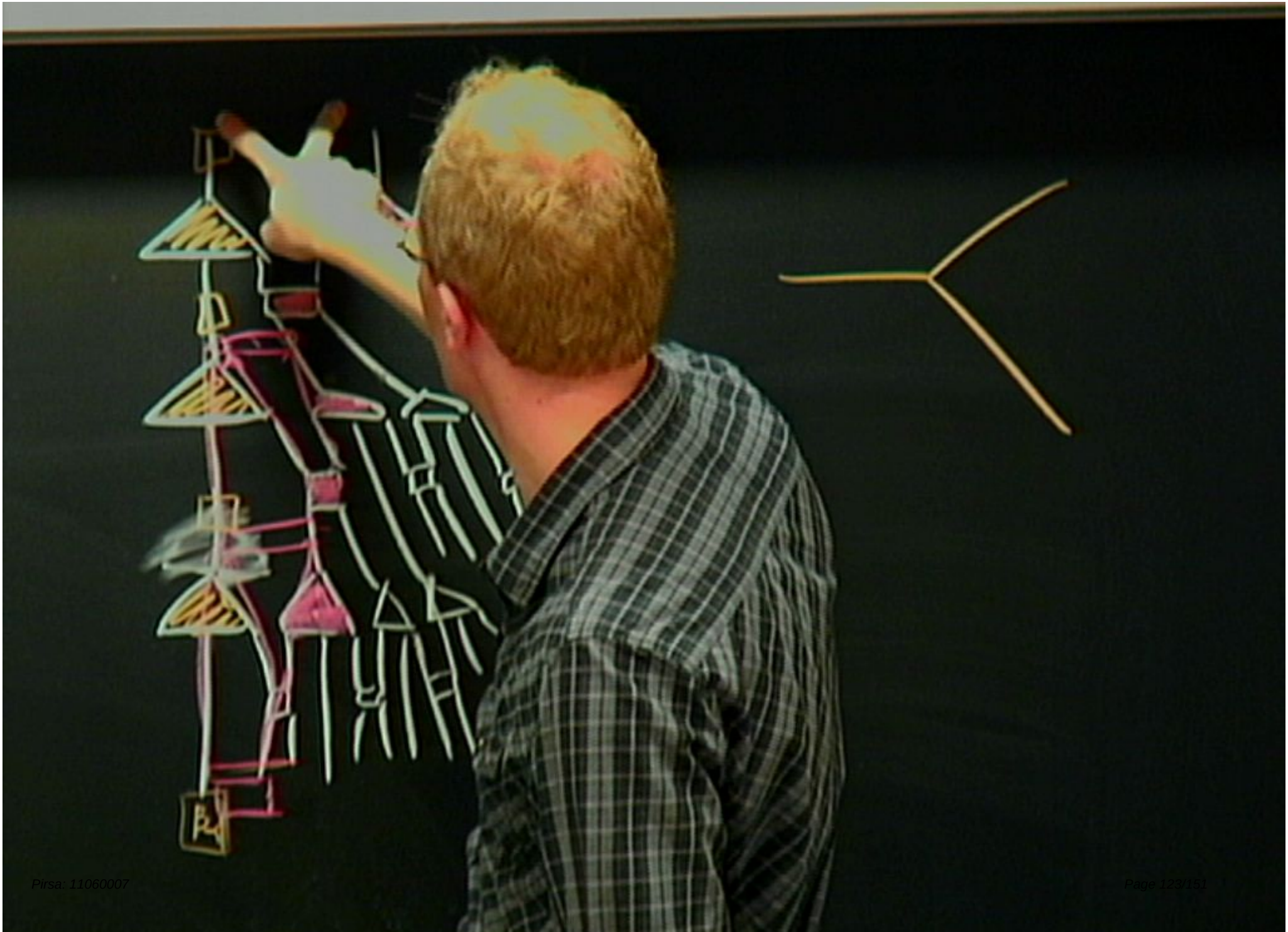

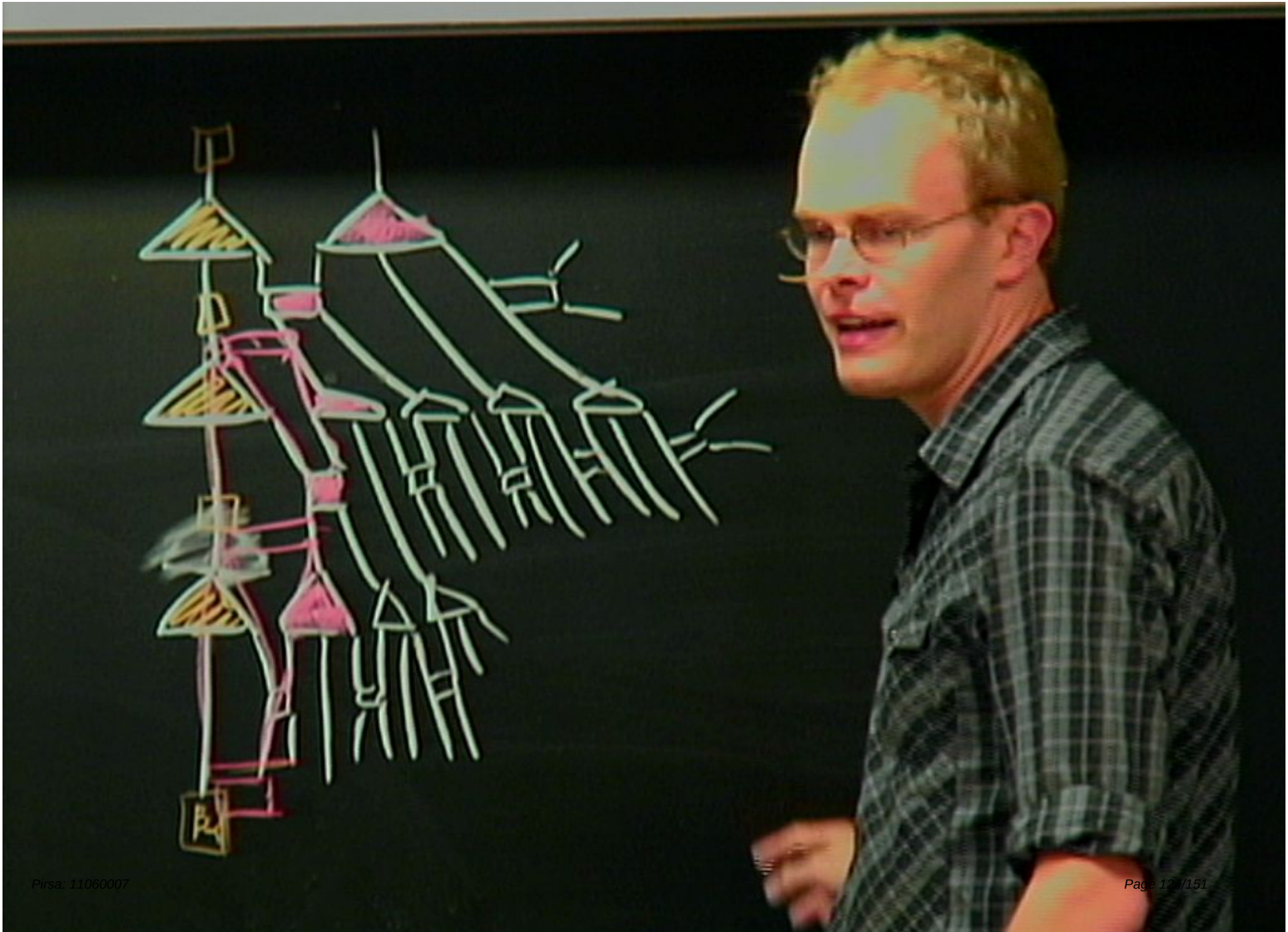

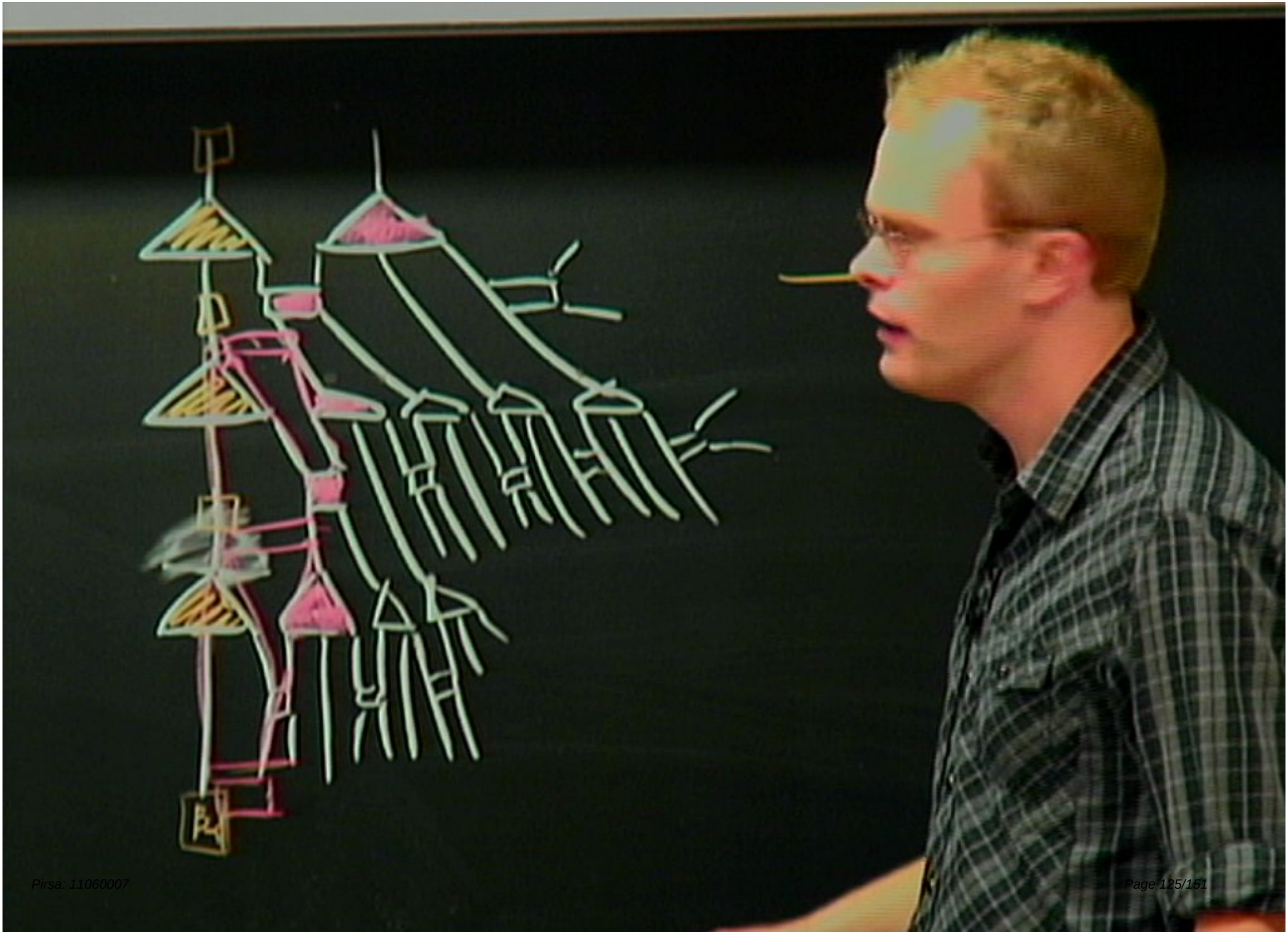

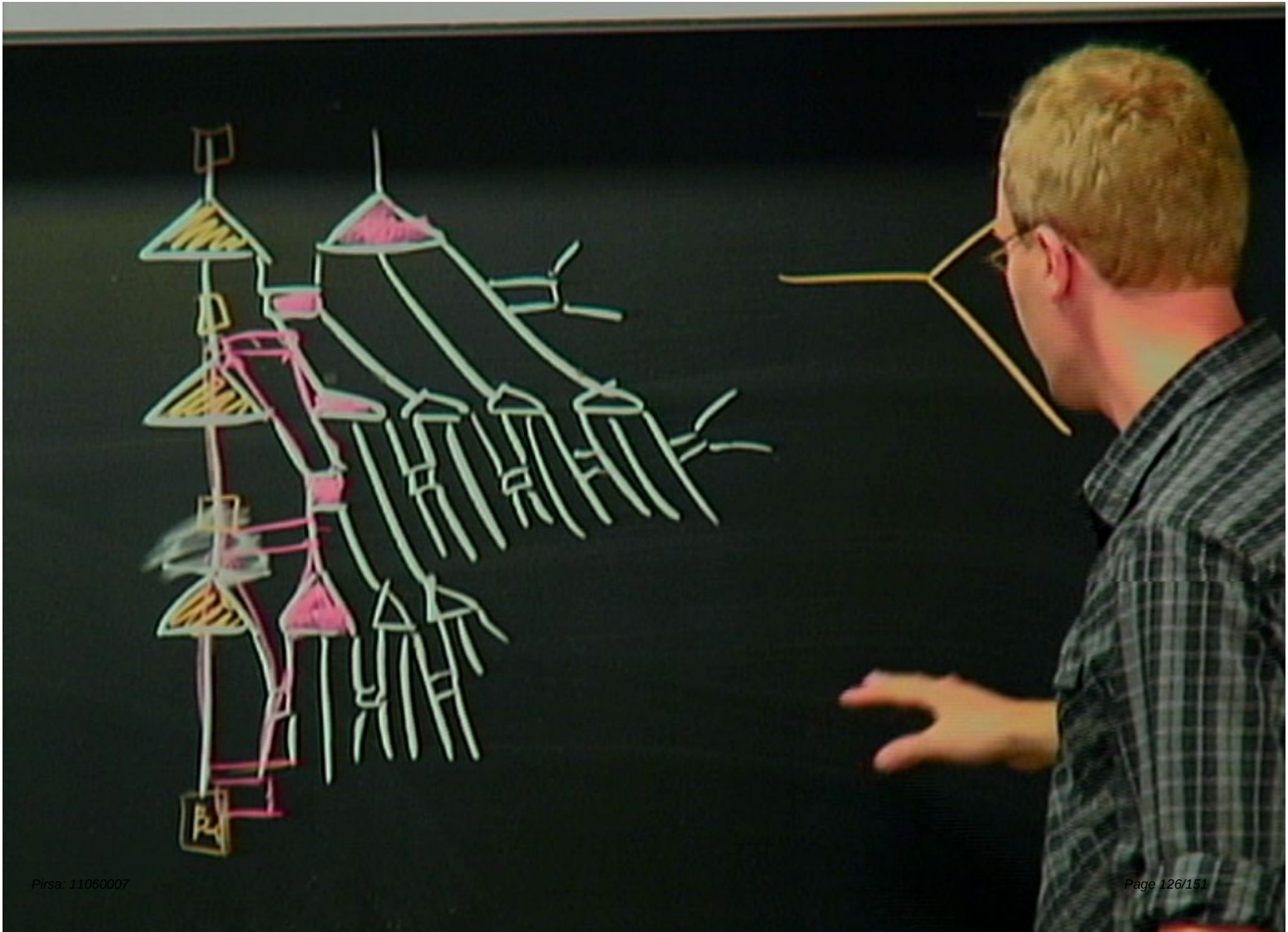

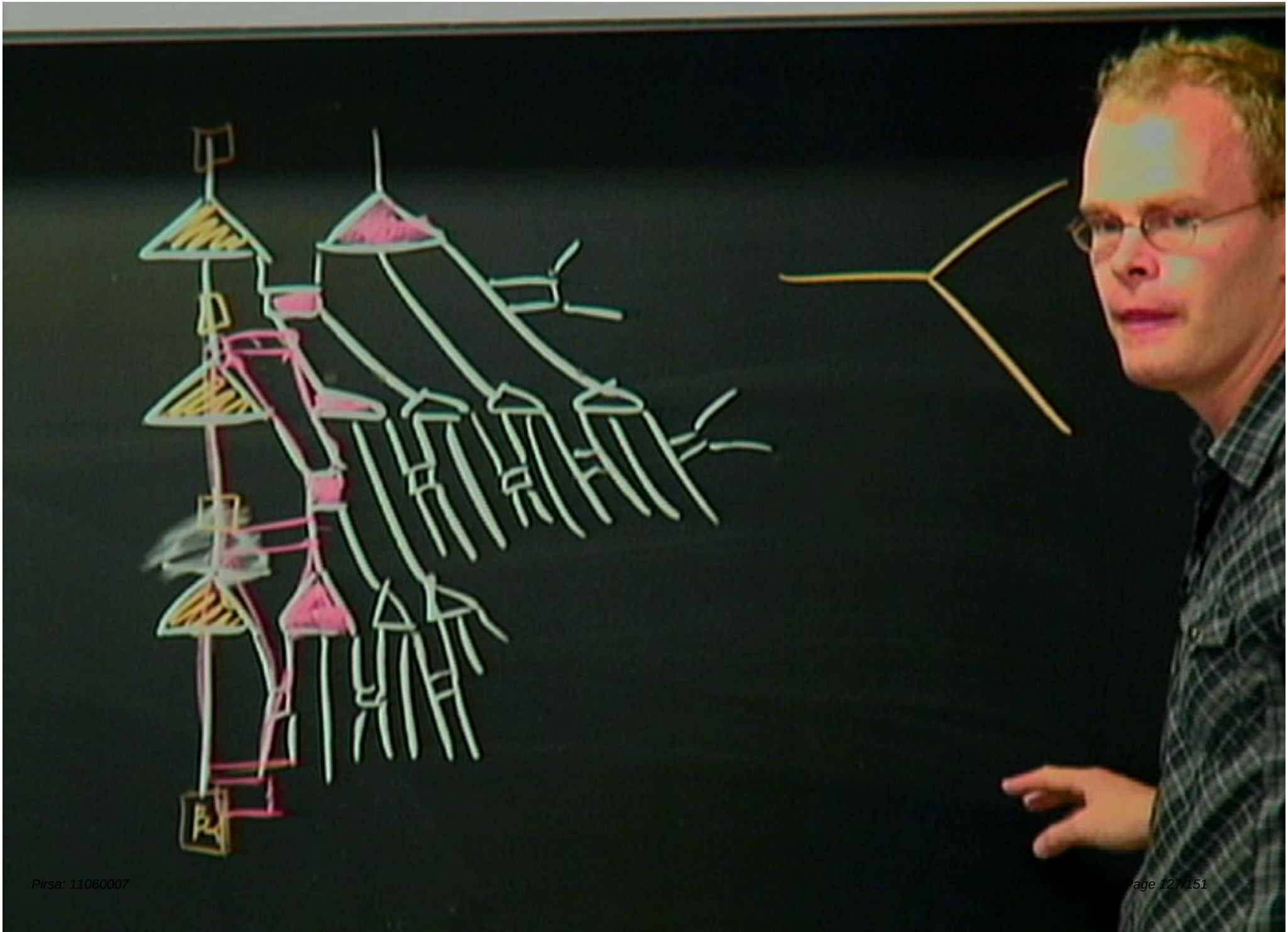

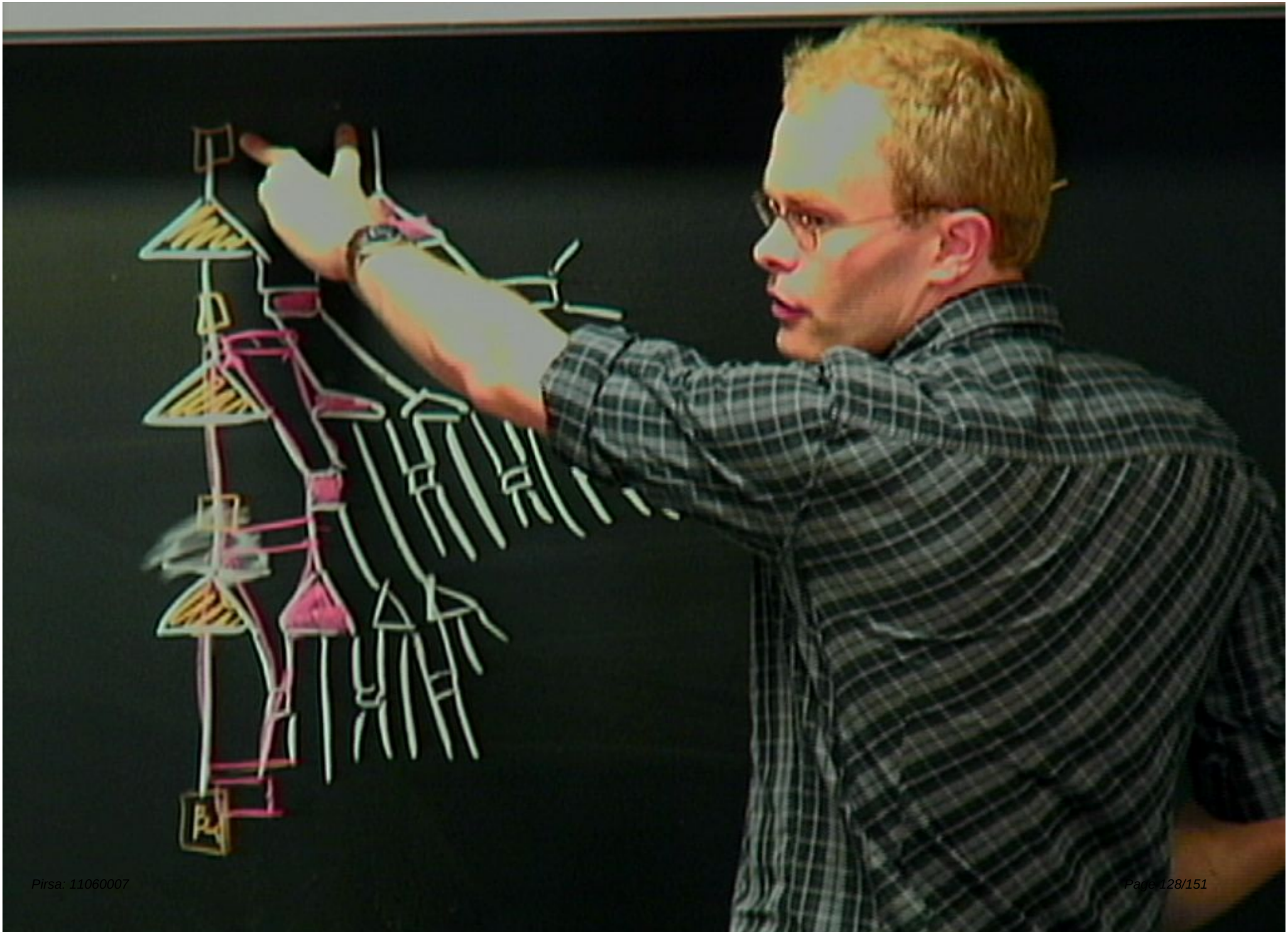

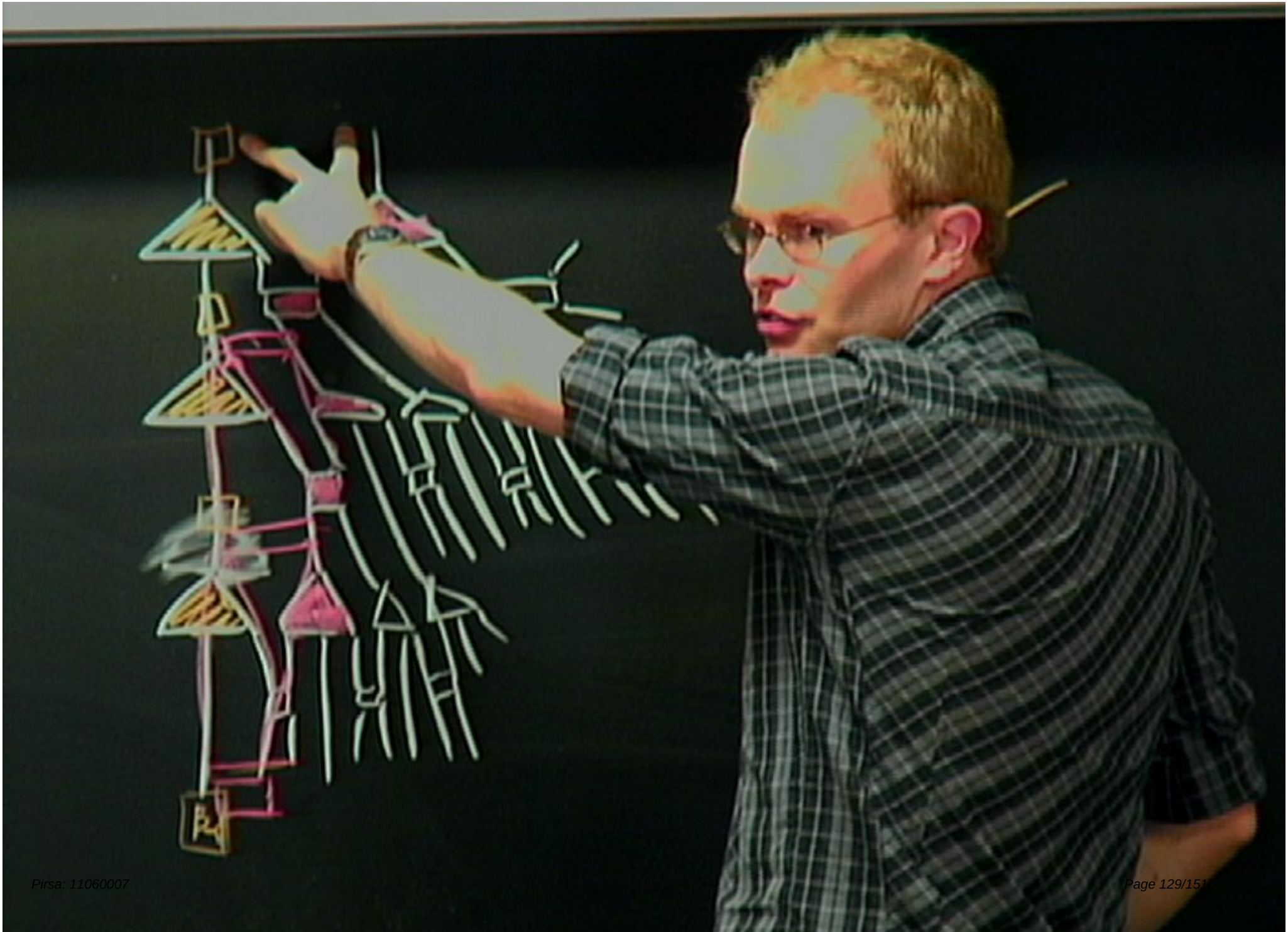

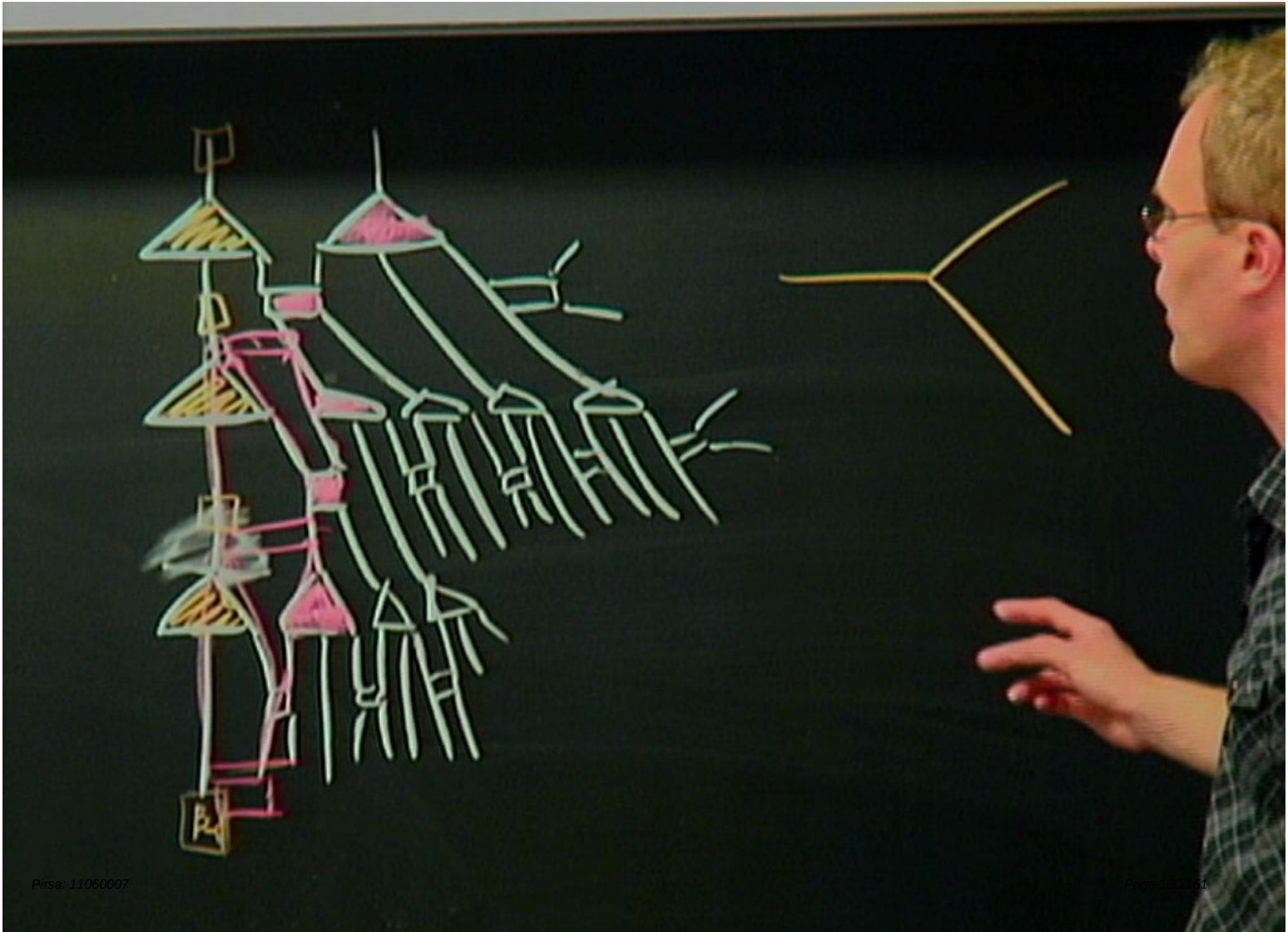

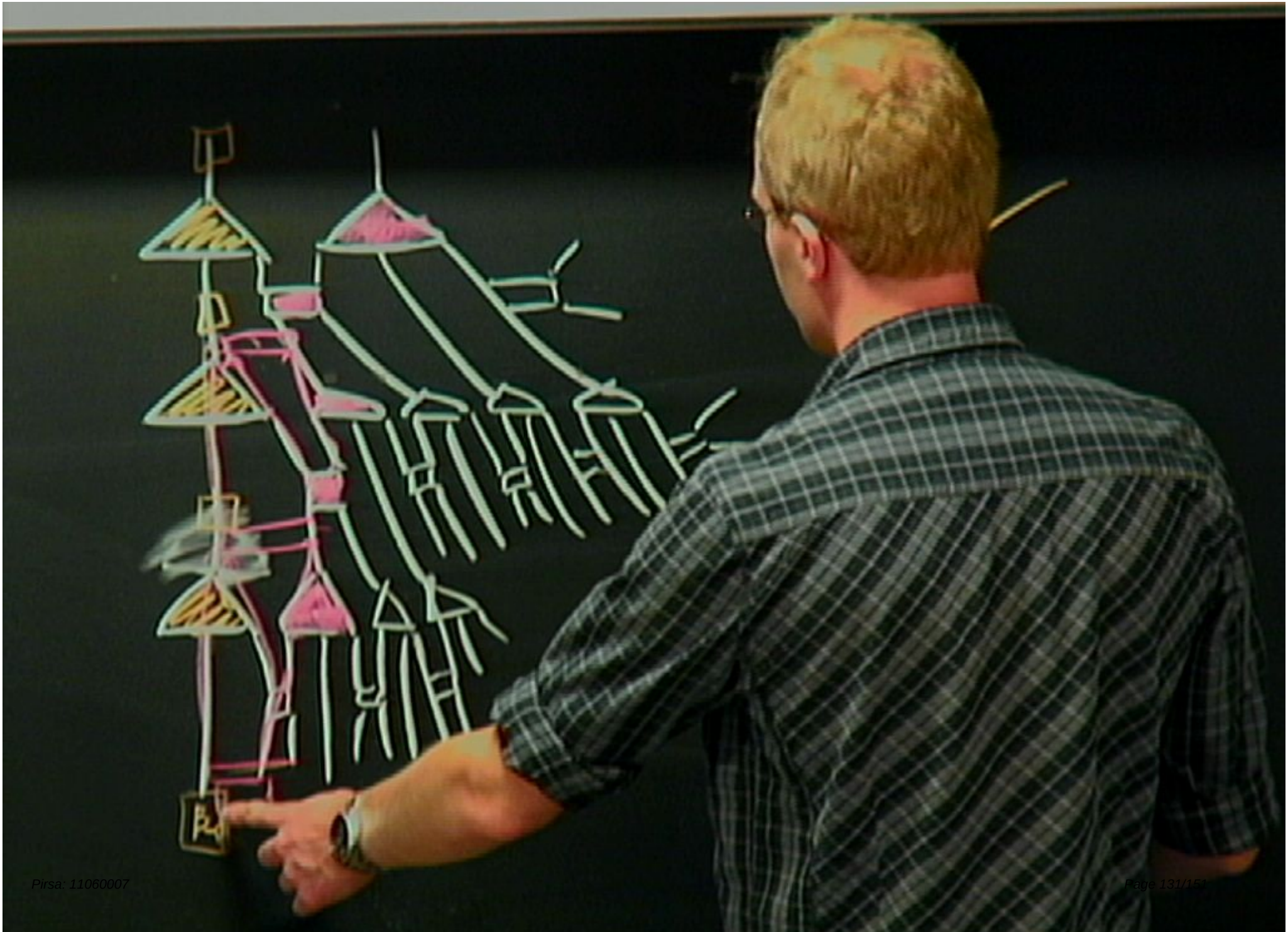

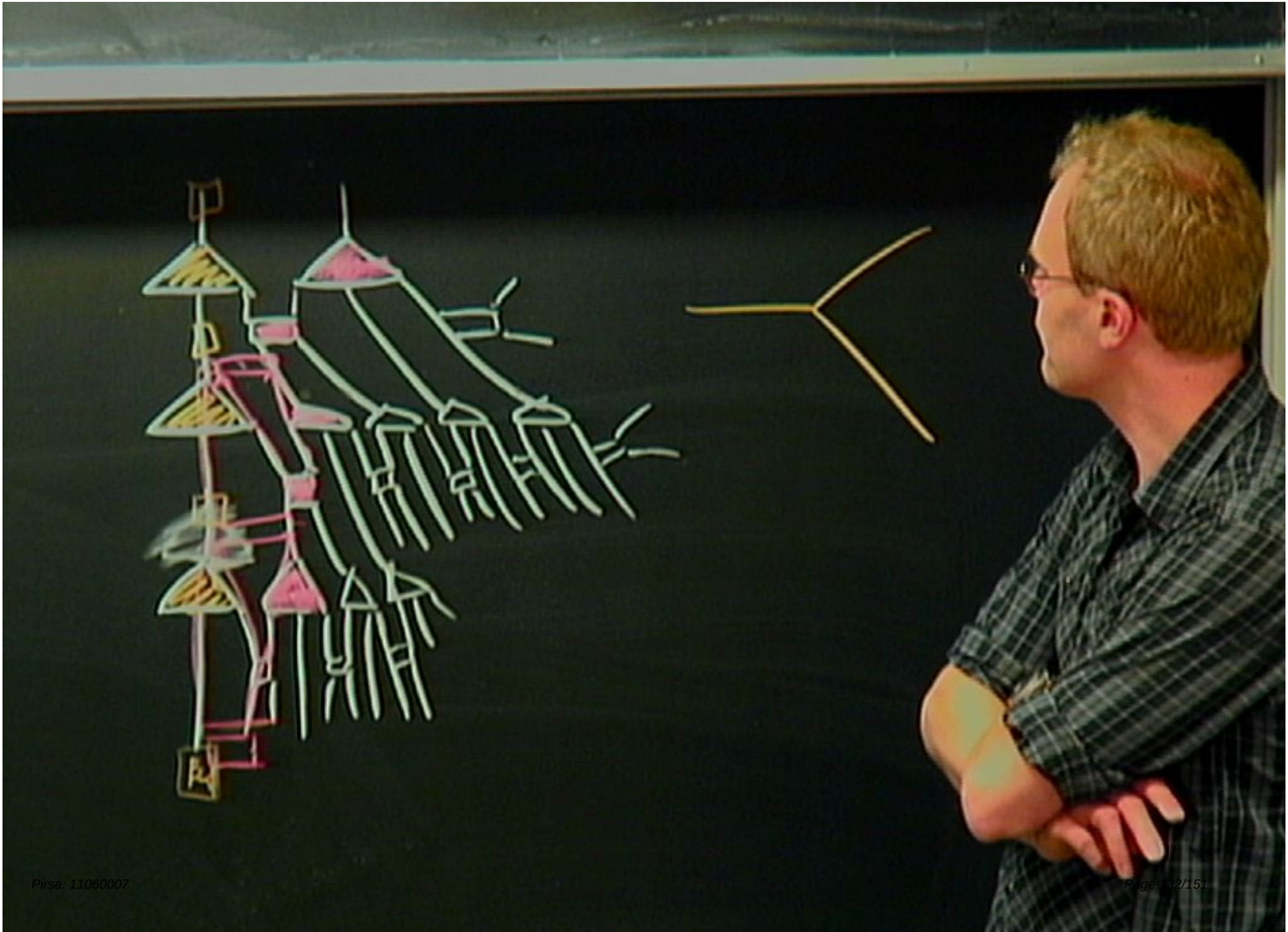

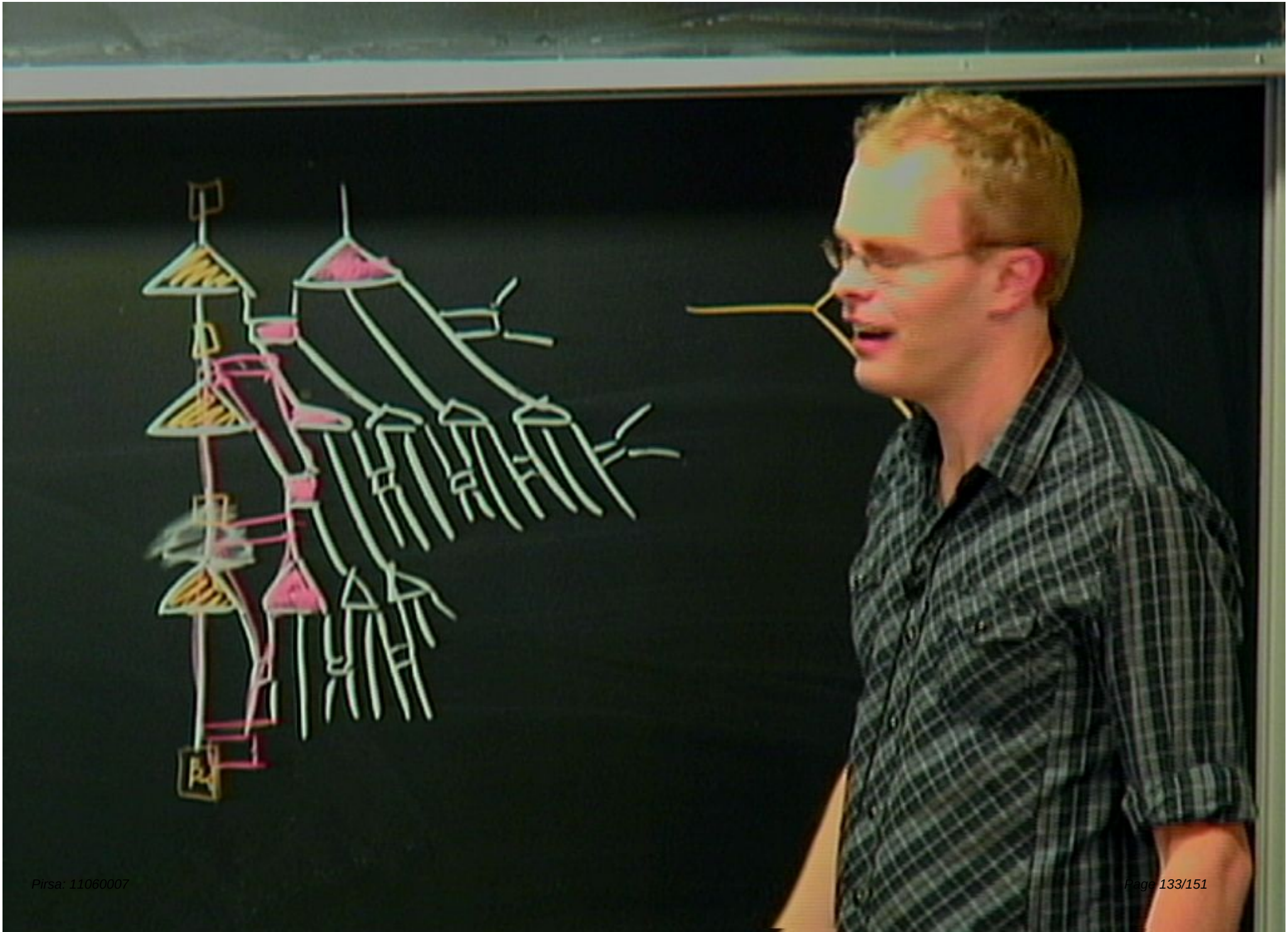

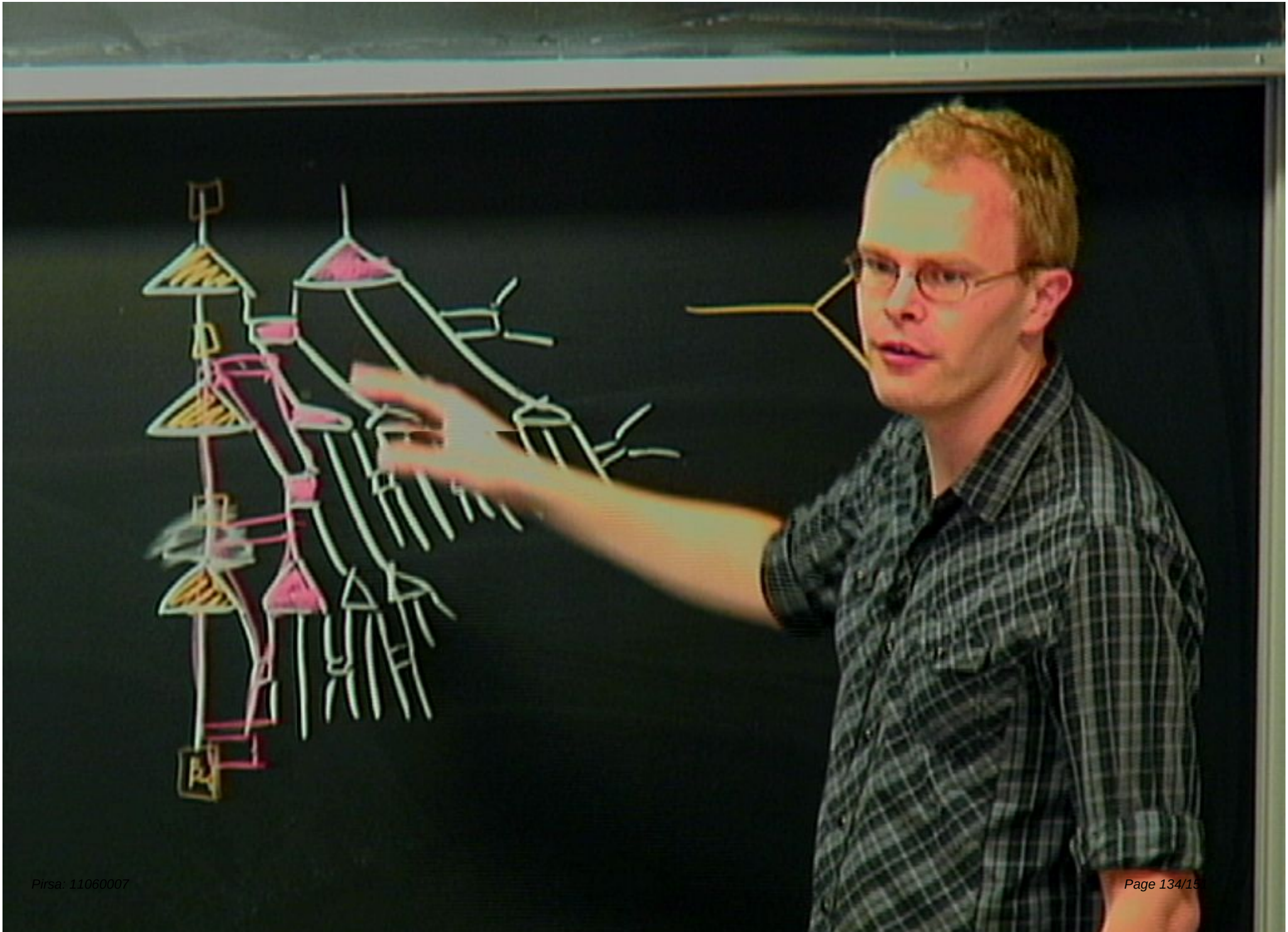

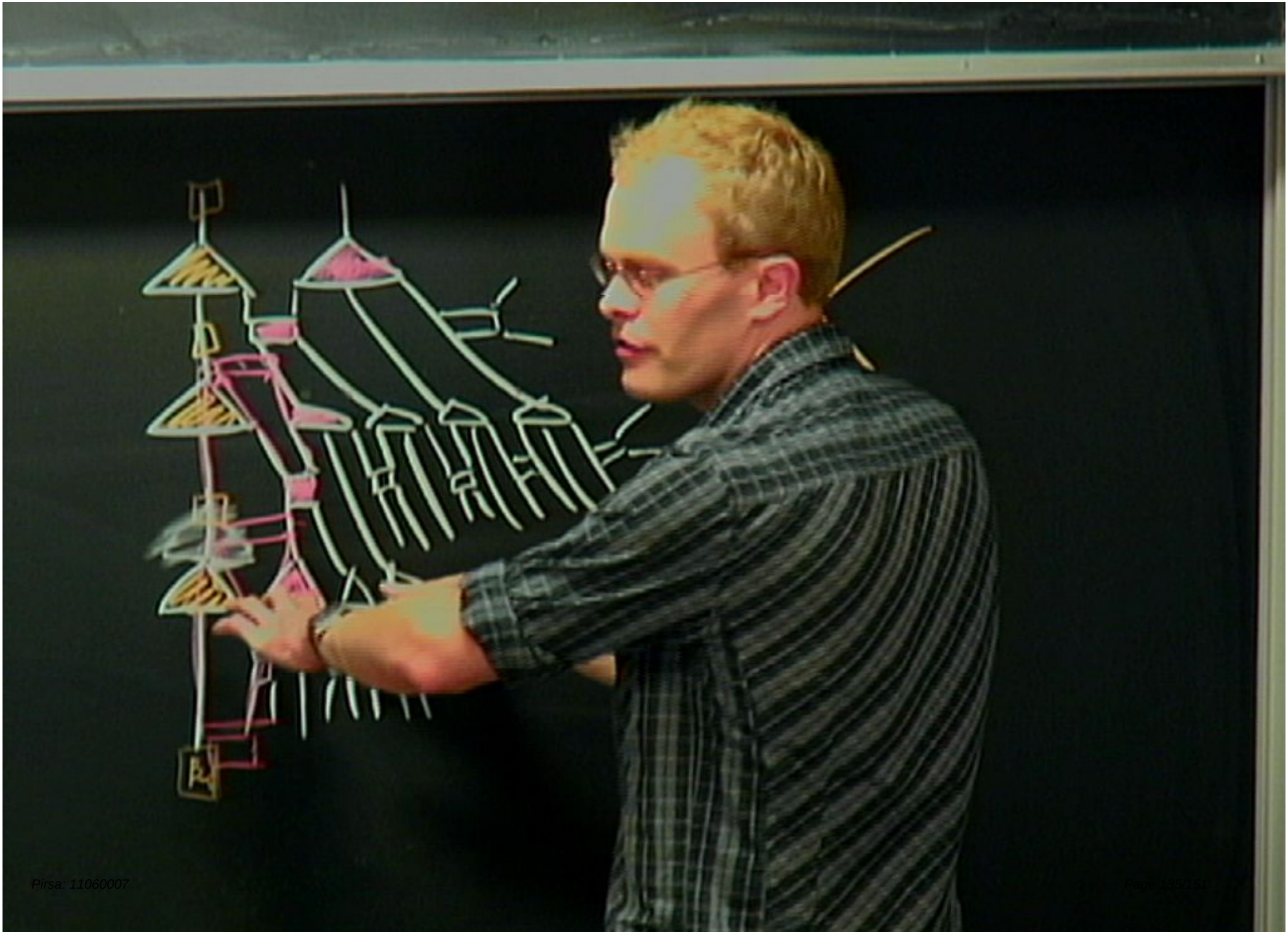

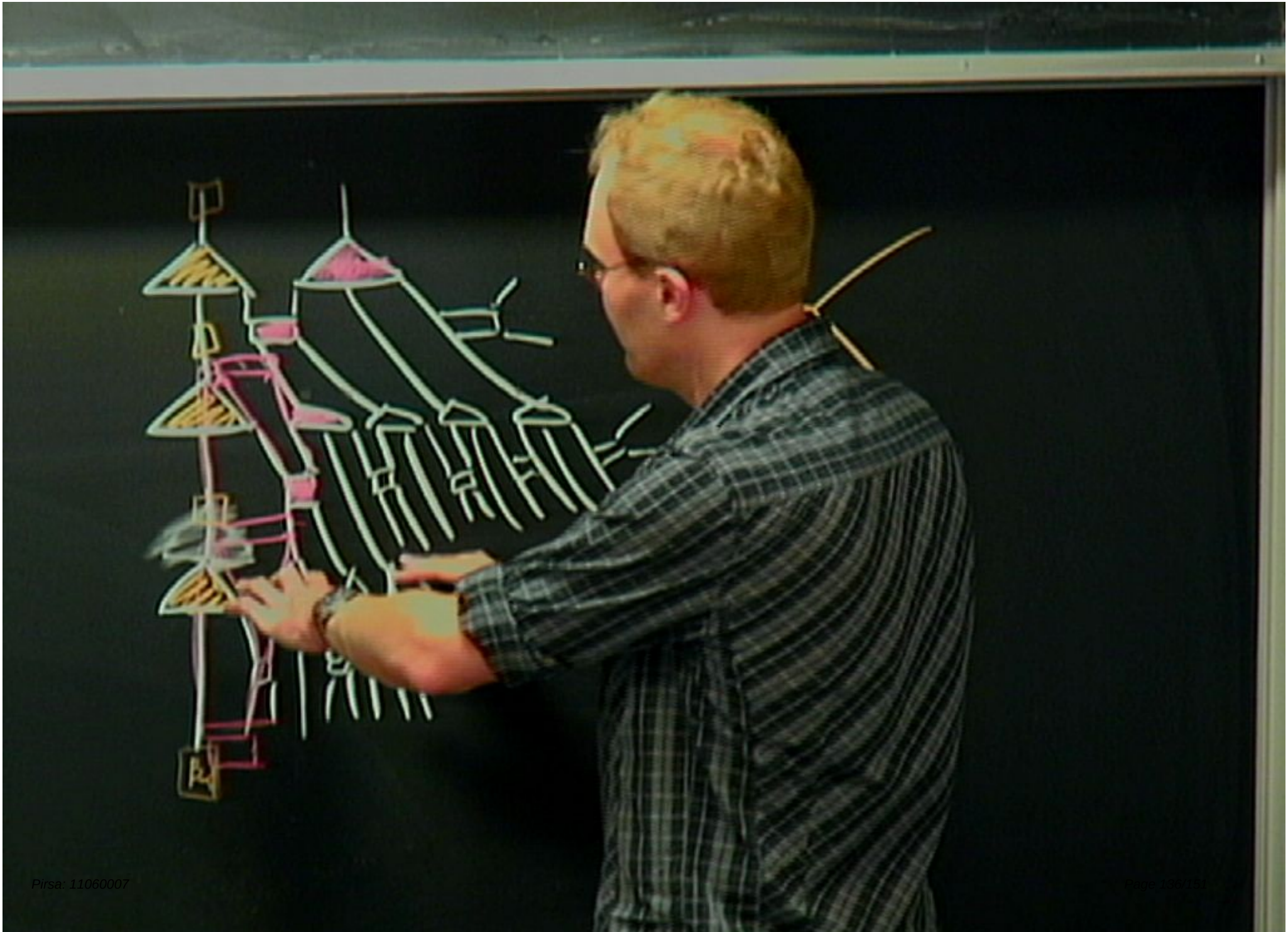

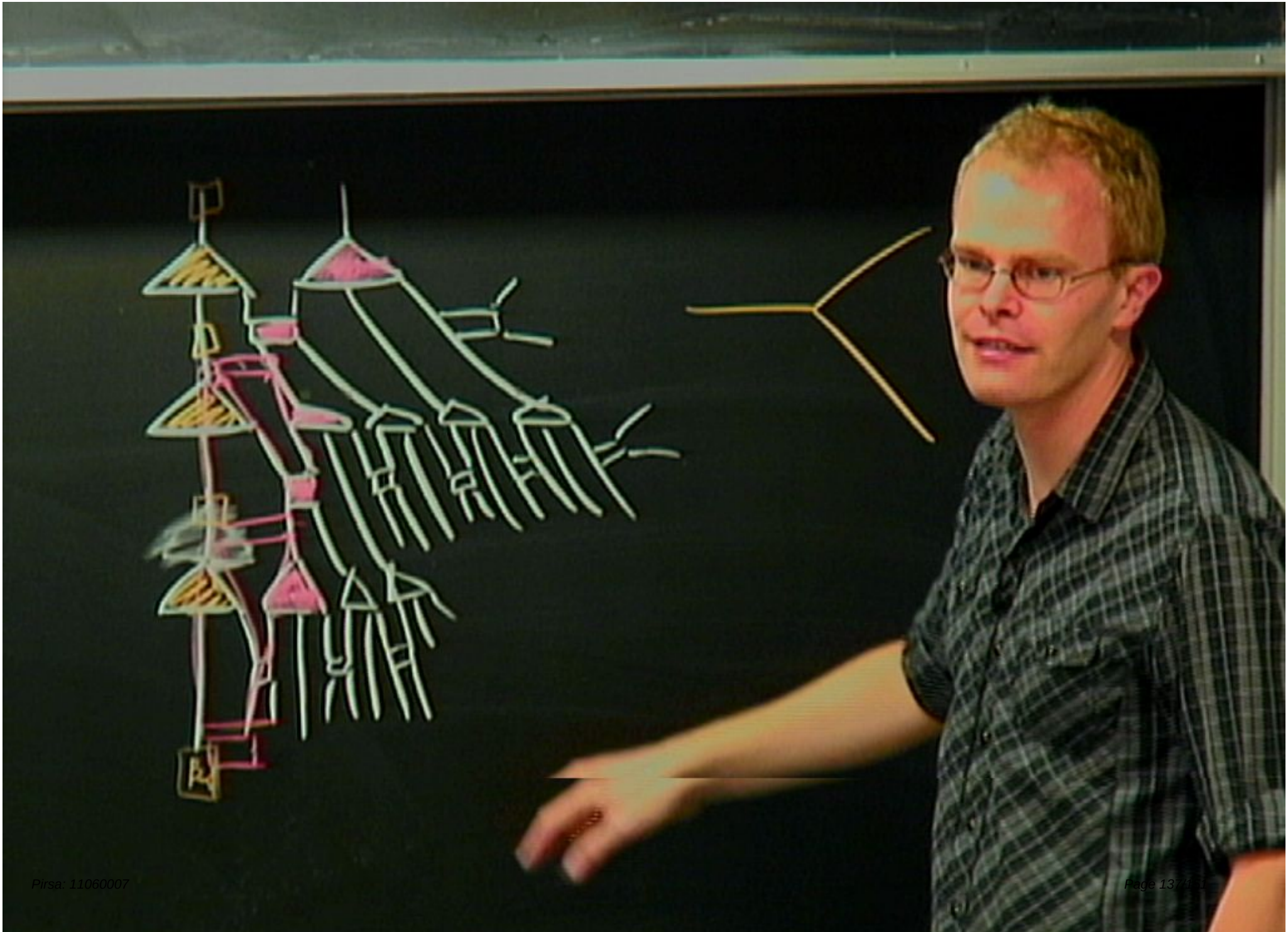

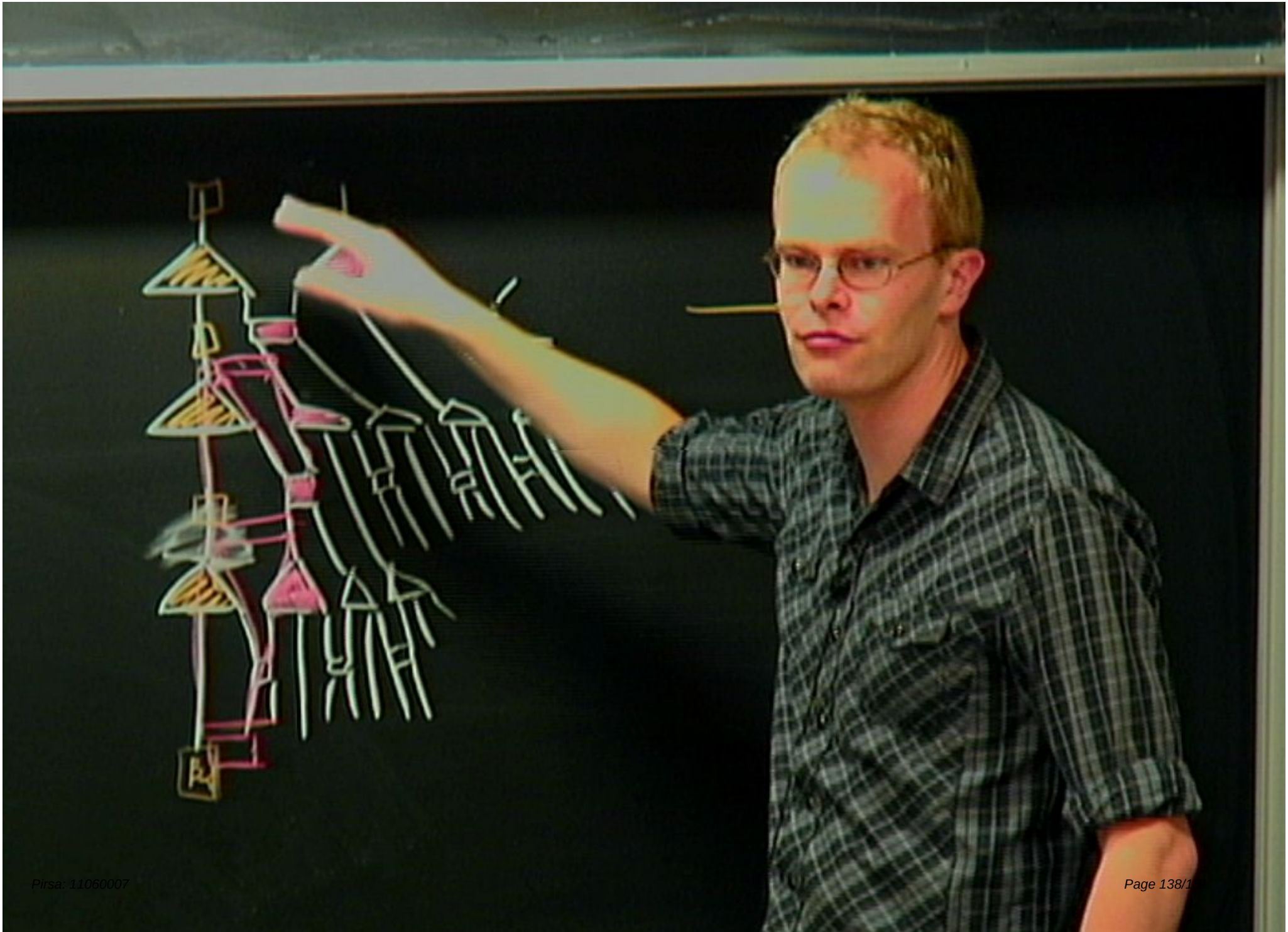

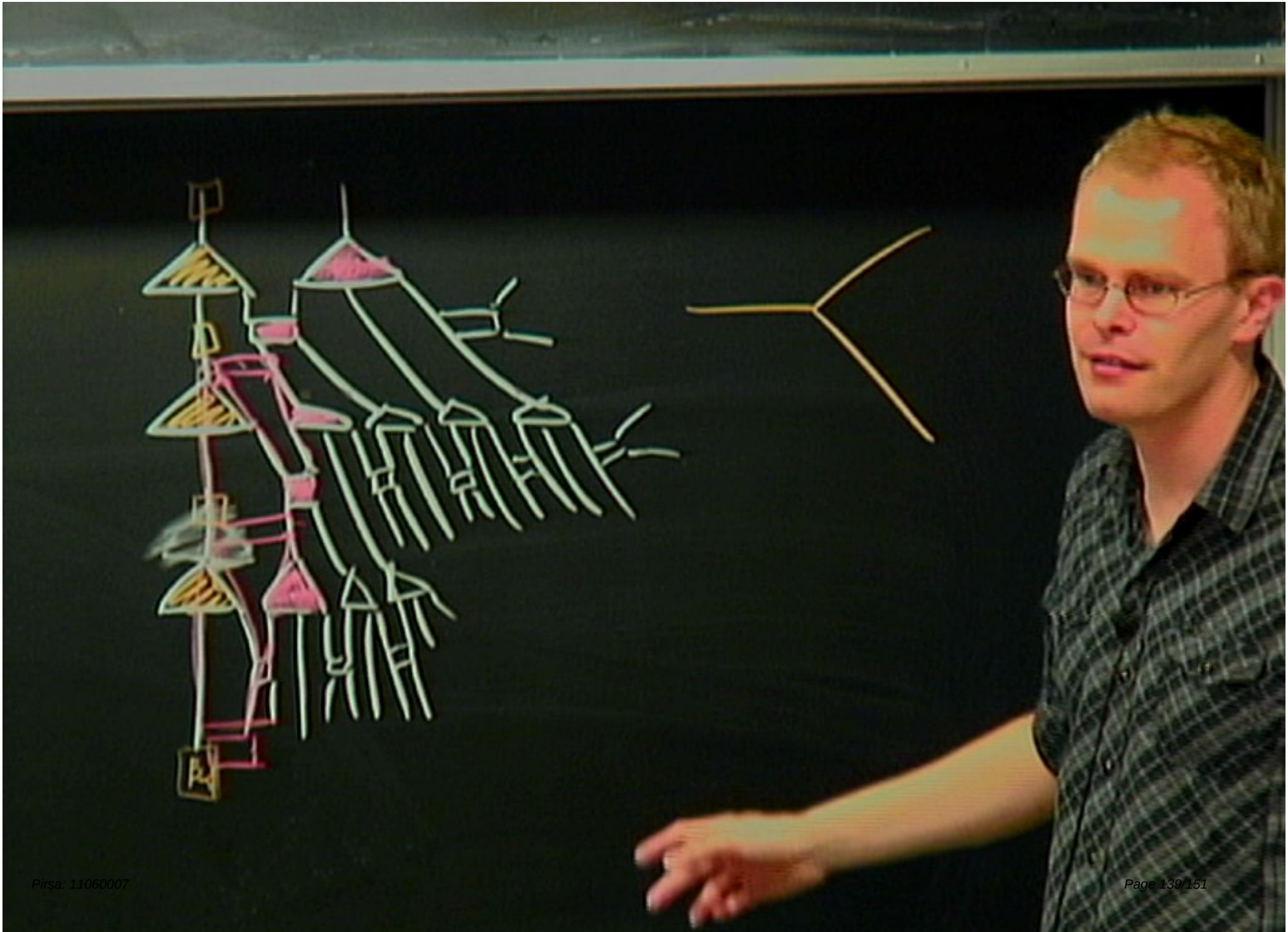

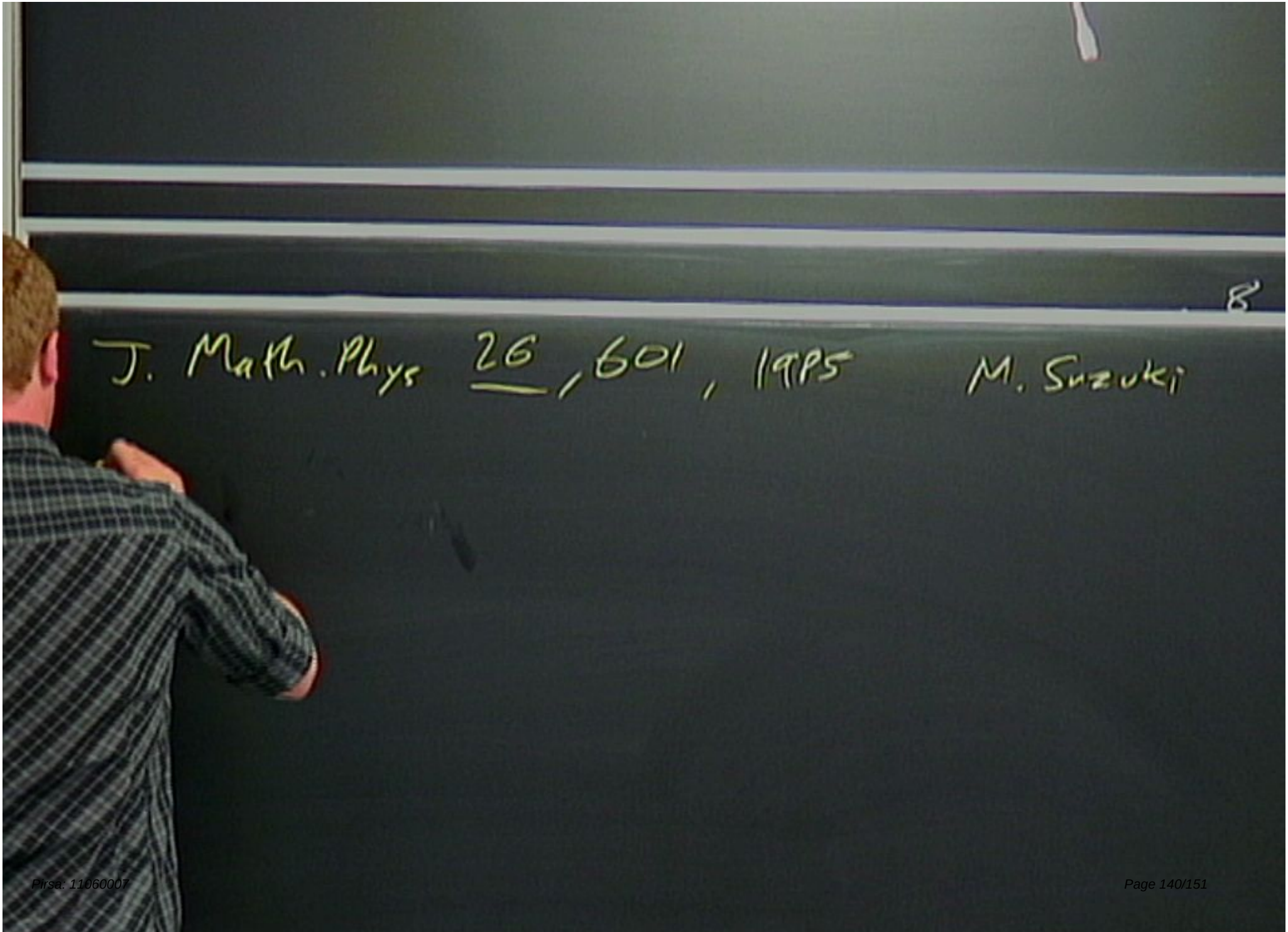
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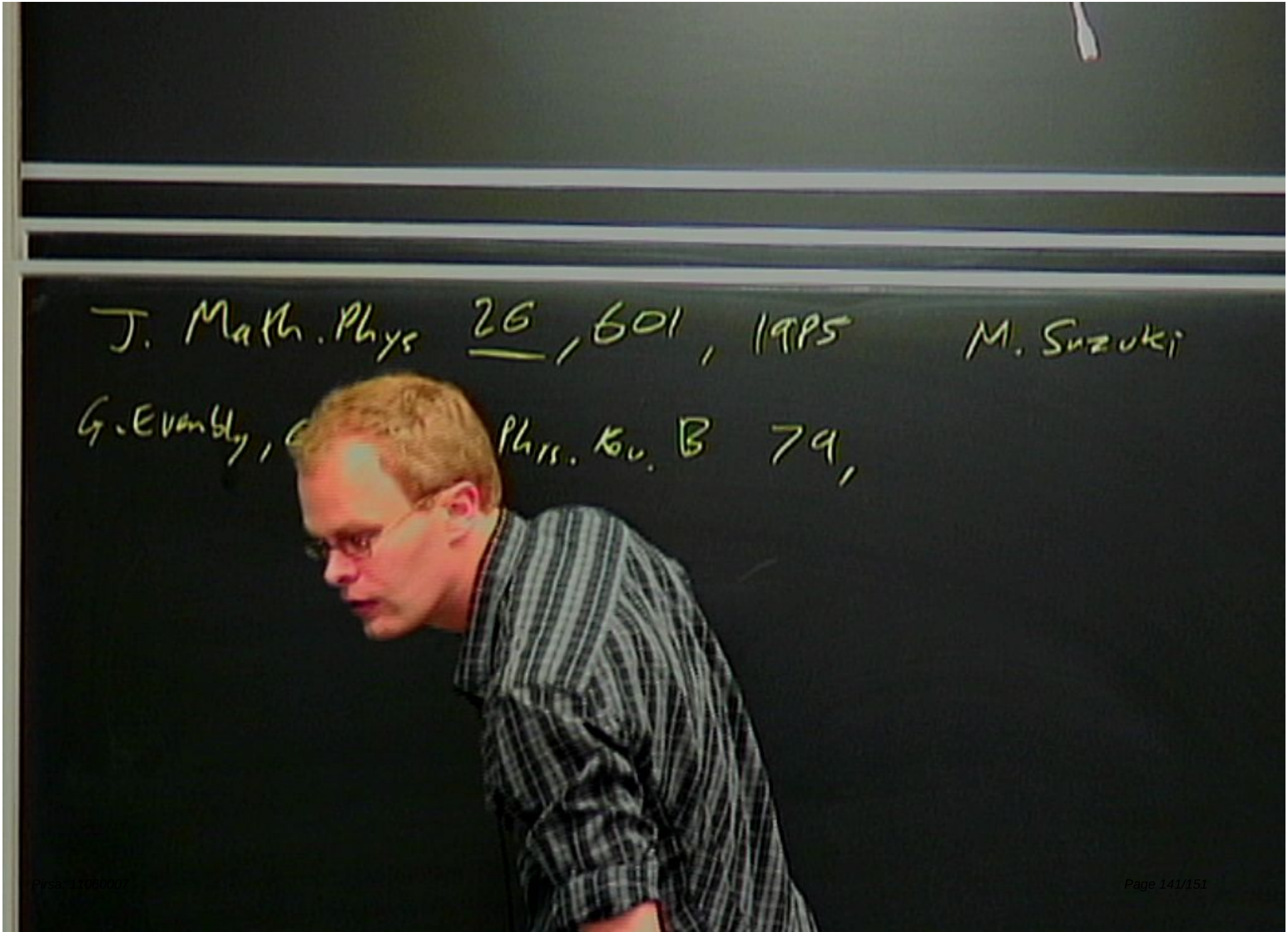
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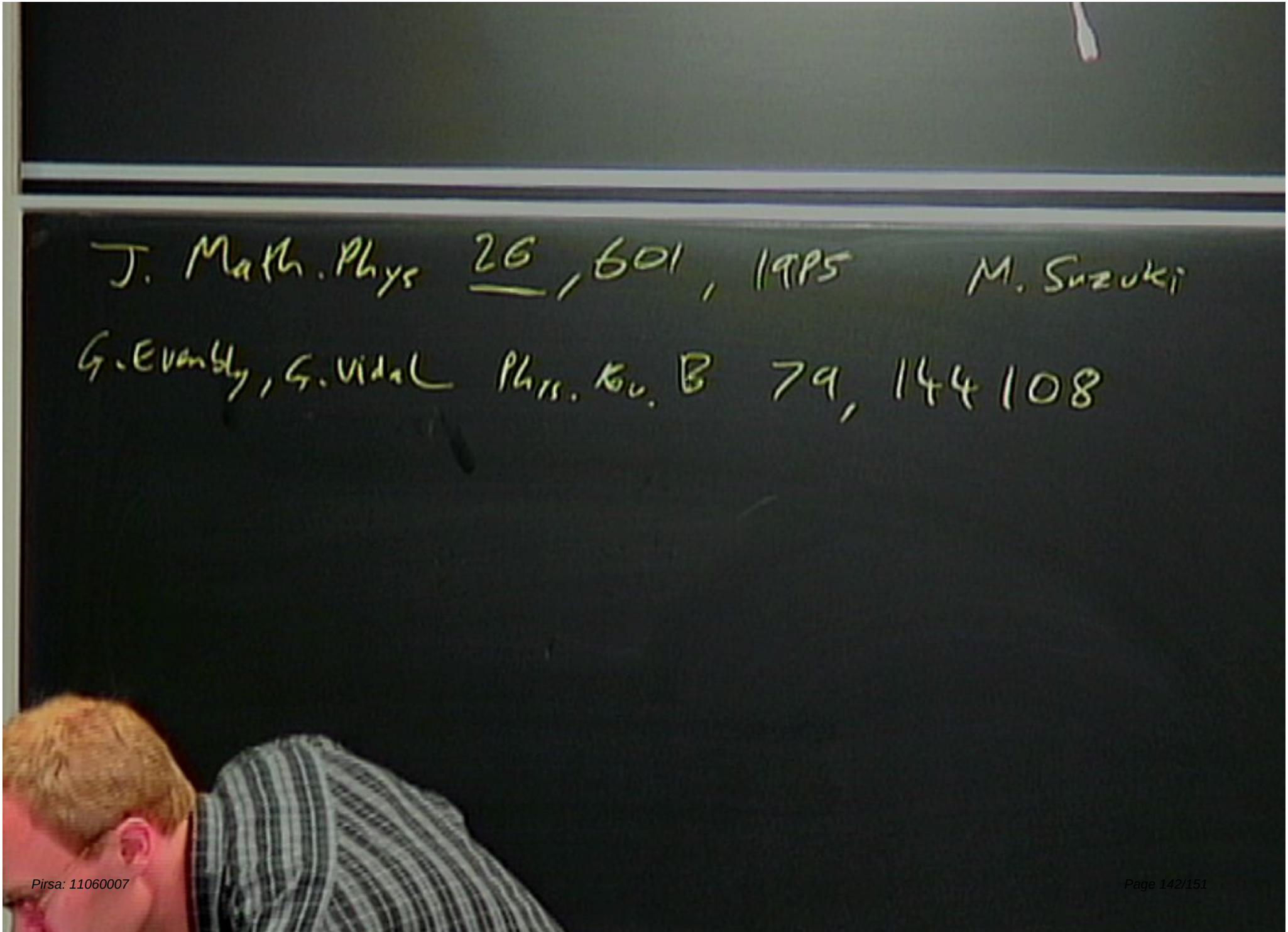
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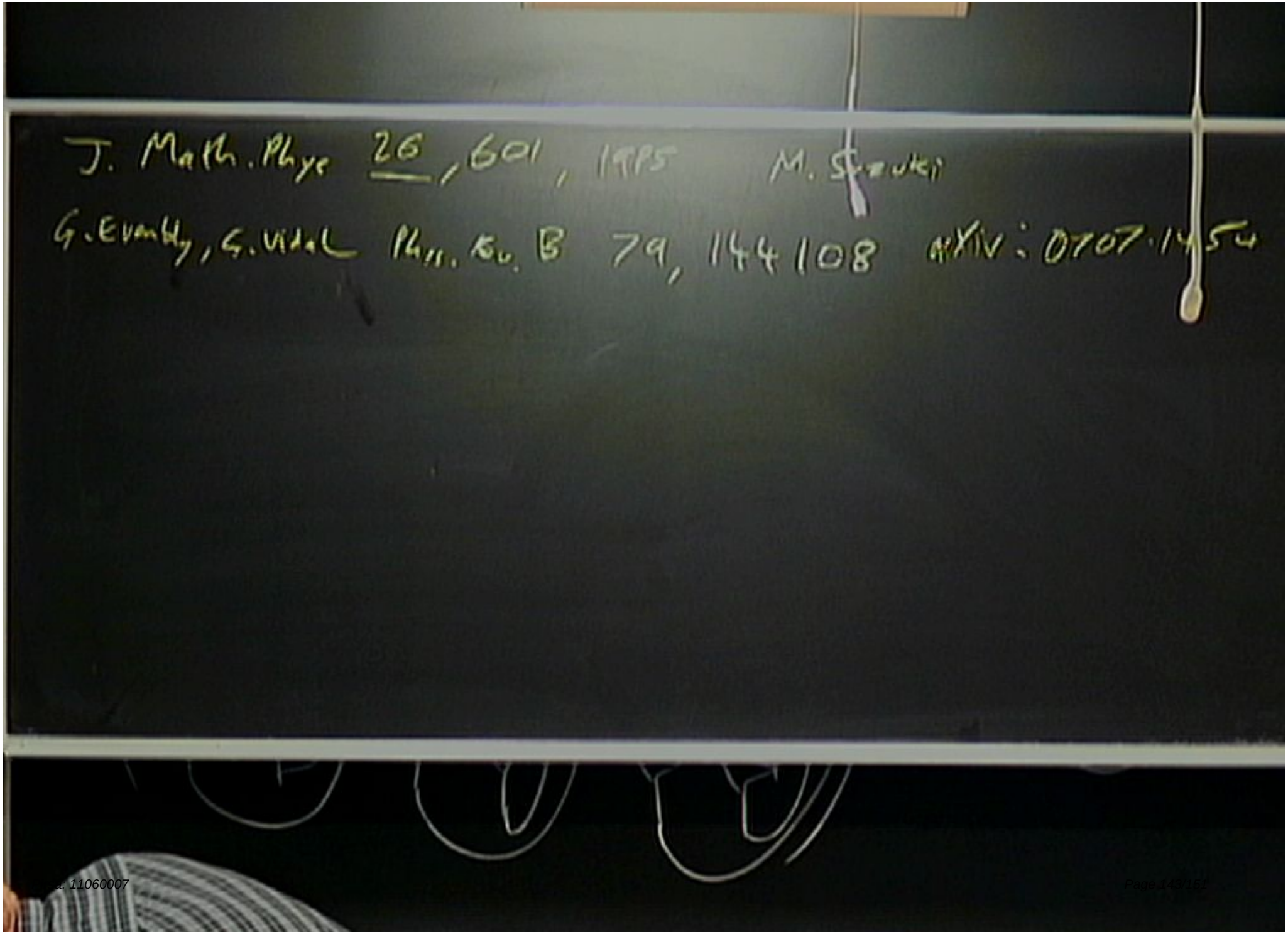

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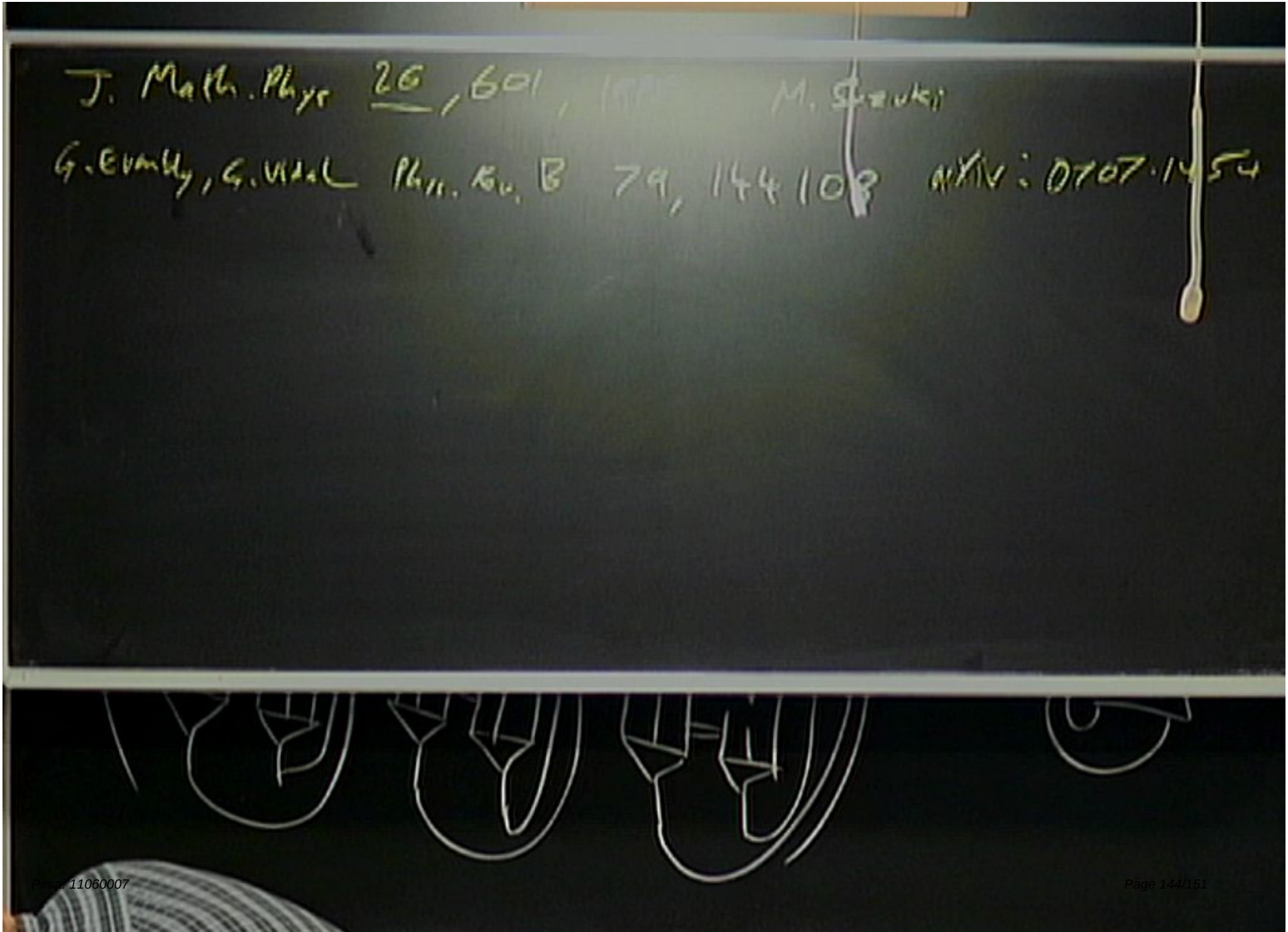
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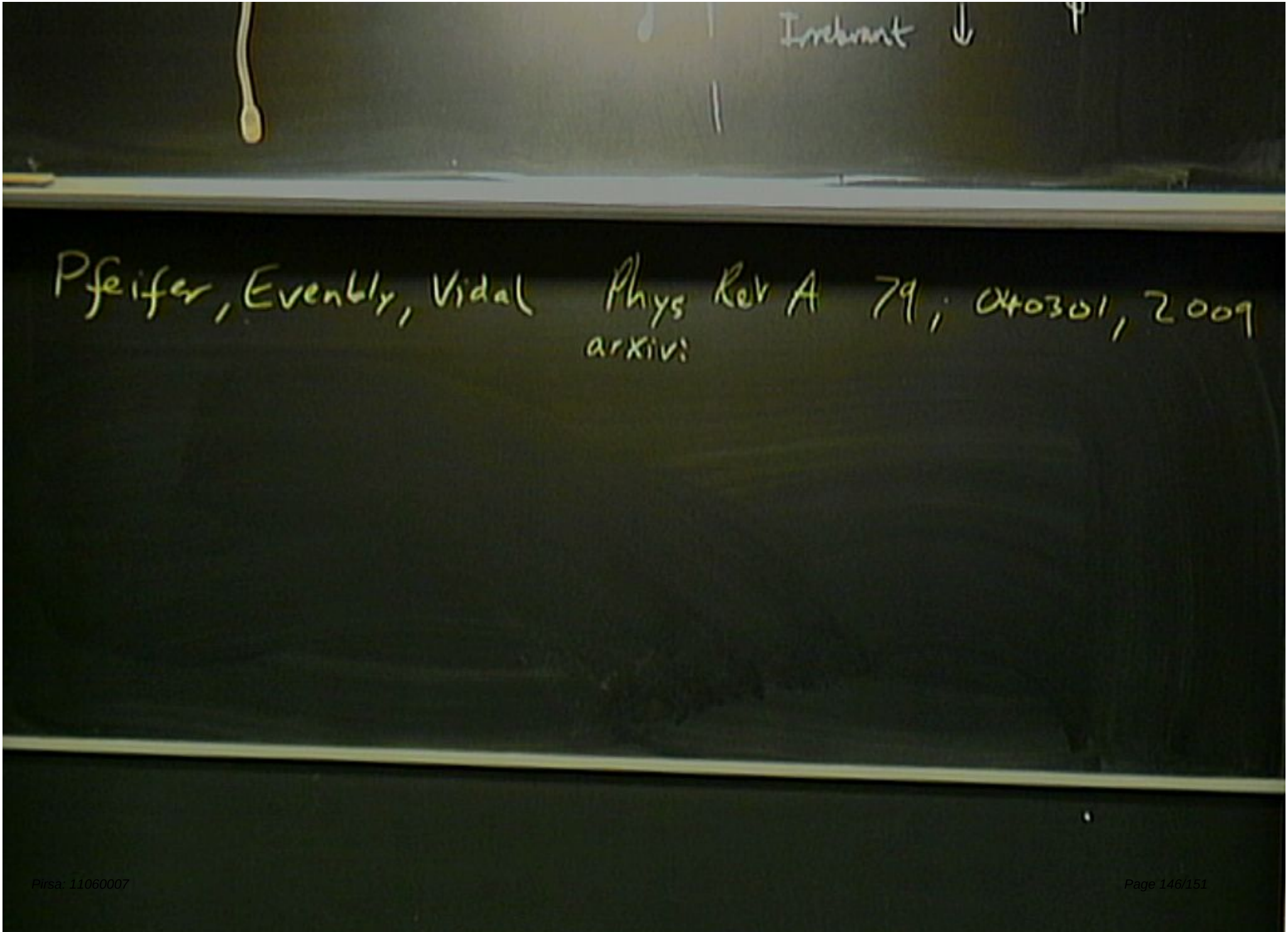
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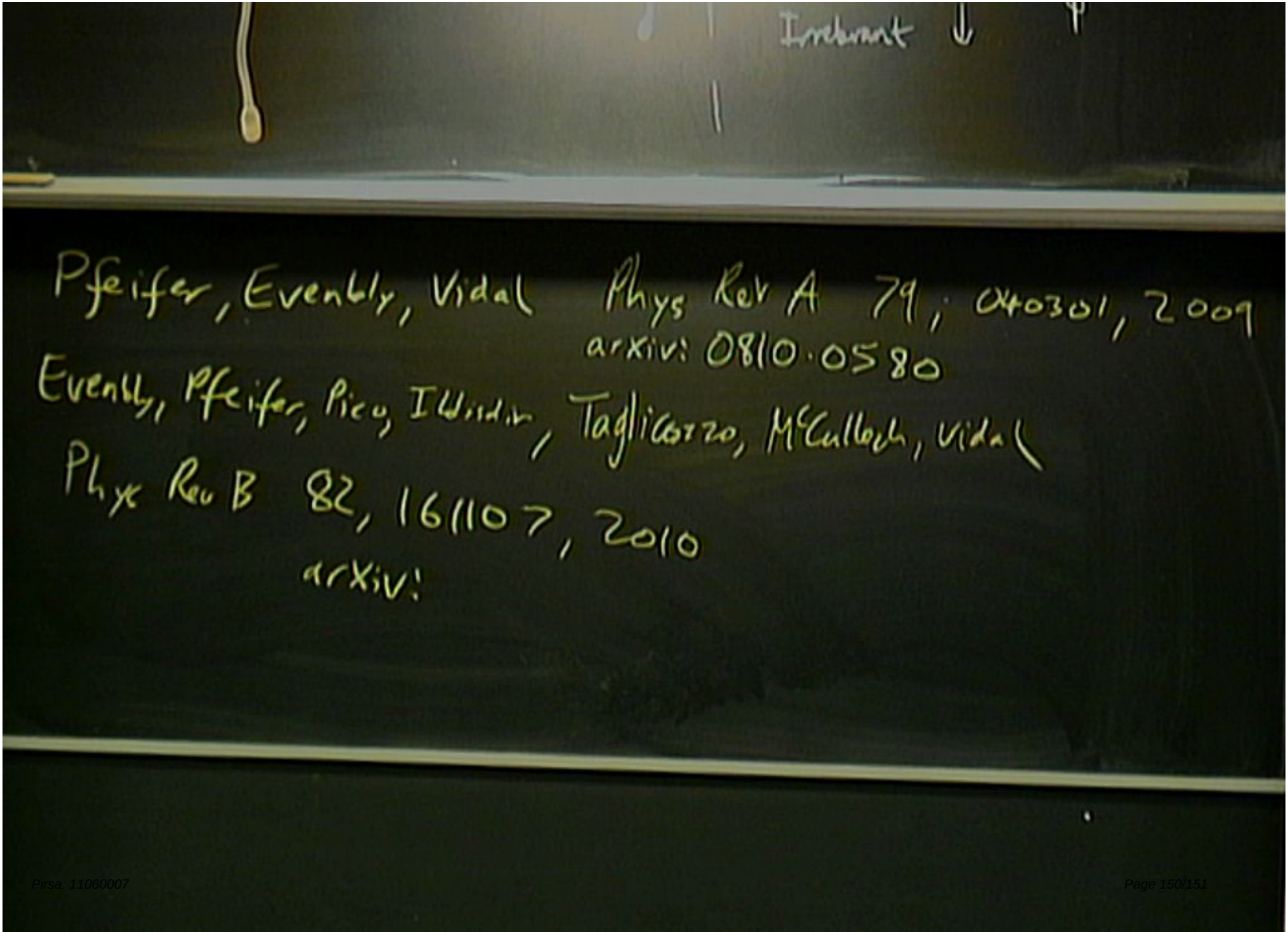
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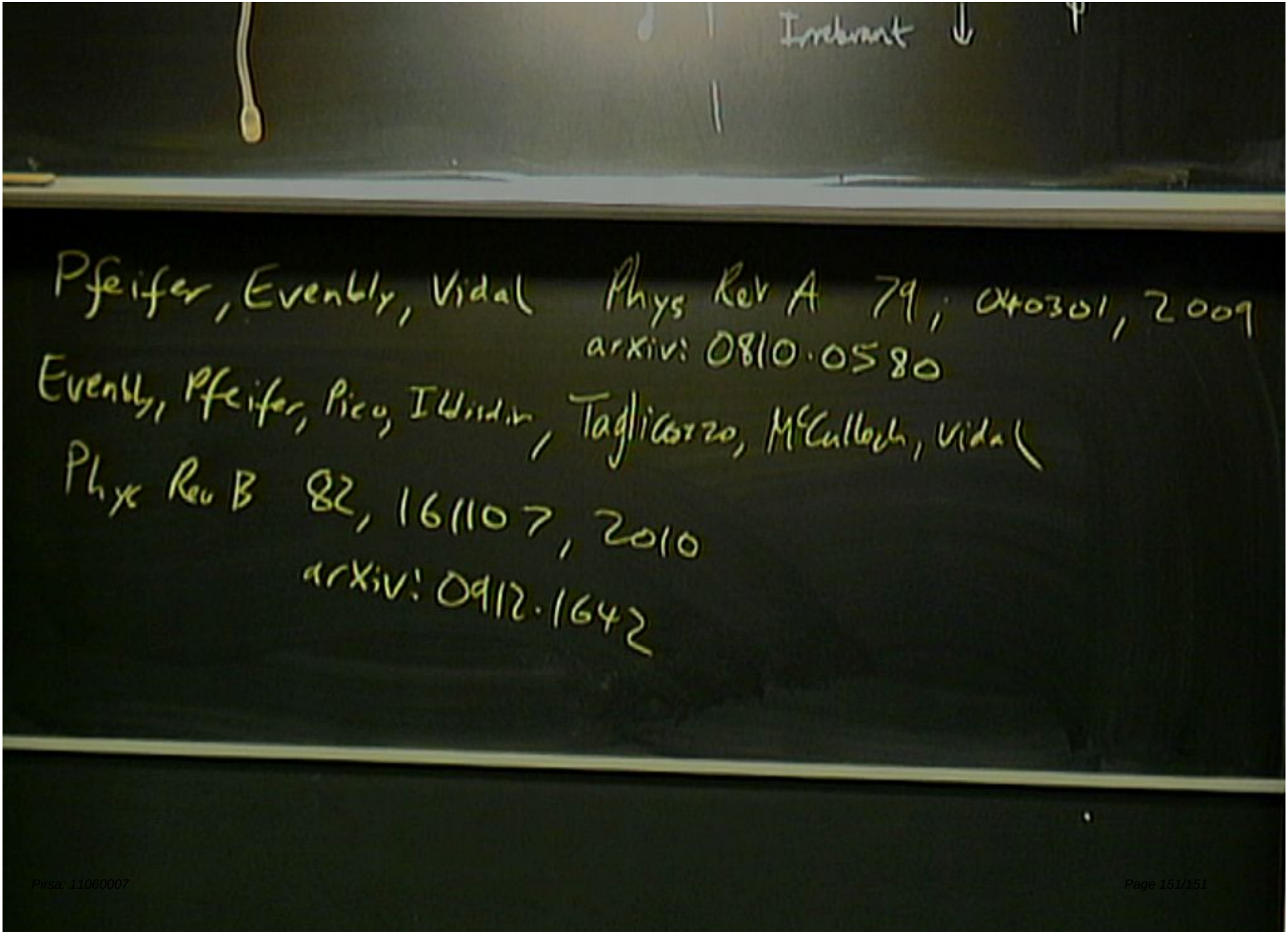
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