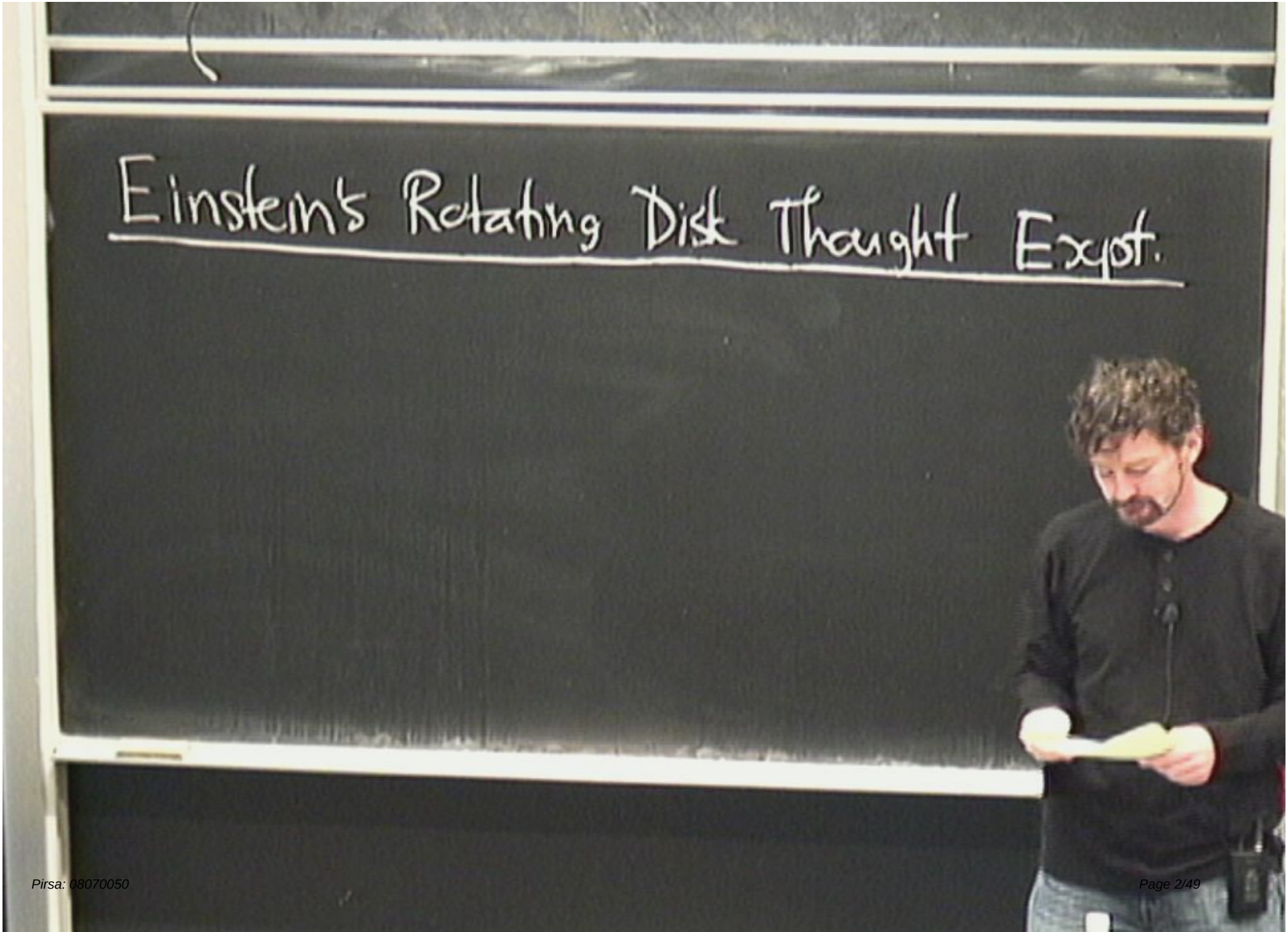
Title: Special Relativity 12 - Einstein's Rotating Disk Thought Experiment

Date: Jul 27, 2008 09:00 AM

URL: http://pirsa.org/08070050

Abstract: Introduction to Einstein's famous rotating disk thought experiment, which he used to help him understand the true nature of gravity.
 Learning Outcomes:
â€¢ Understanding that an observer placed at the edge of a rotating disk (or inside a rotating cylinder) experiences an artificial gravitational field related to his centripetal acceleration.
â€¢ Appreciating the ways in which this artificial gravitational field exactly mimics the real gravitational field we experience near the Earth's surface.
 â€¢ How Einstein realized Newton's model of gravity must be wrong: it does not correctly predict the observed motions of the planets, and it does not respect the speed limit of the universe.


Einstein's Rotating Disk Thought Expt.

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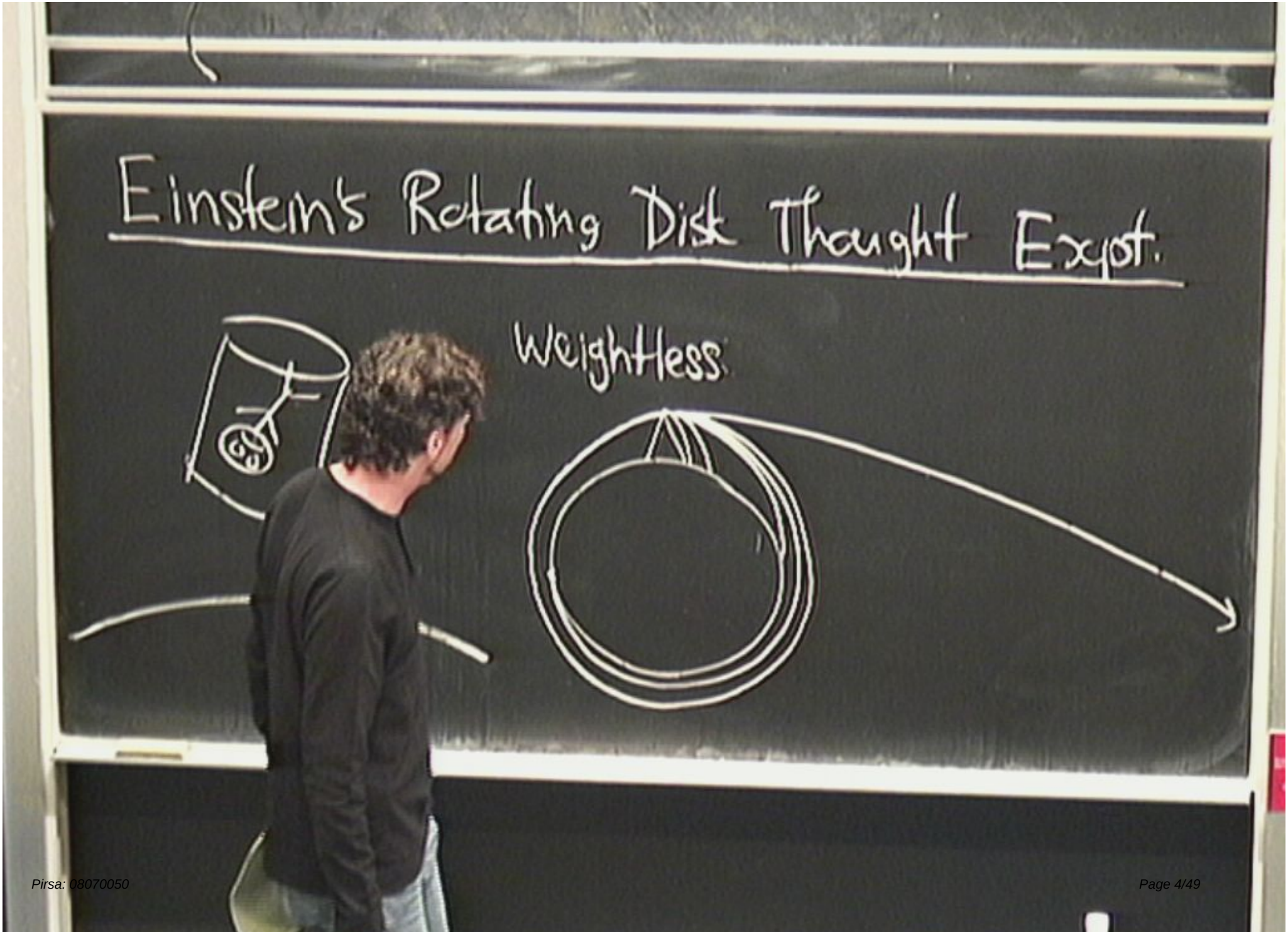
Weightless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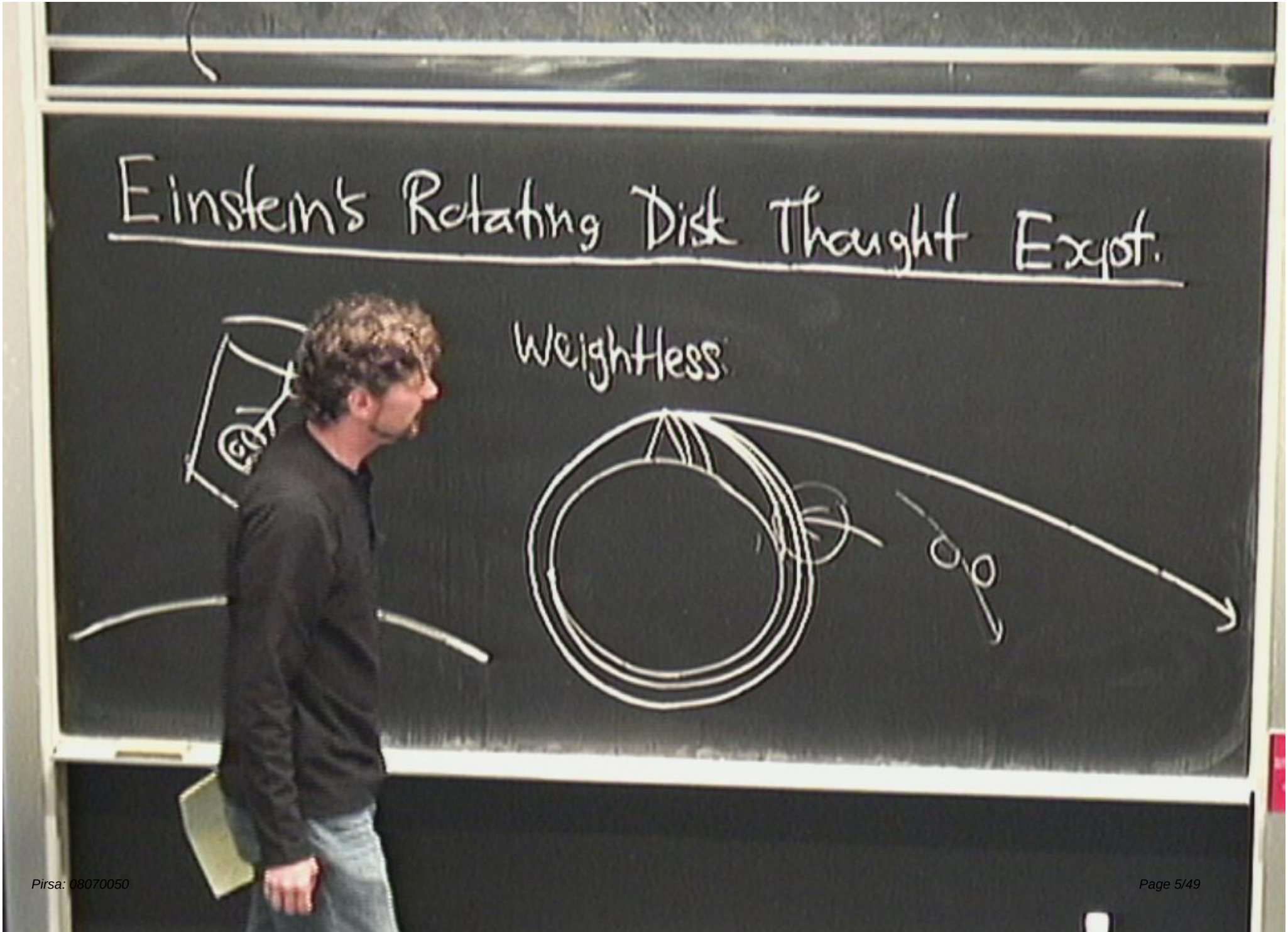
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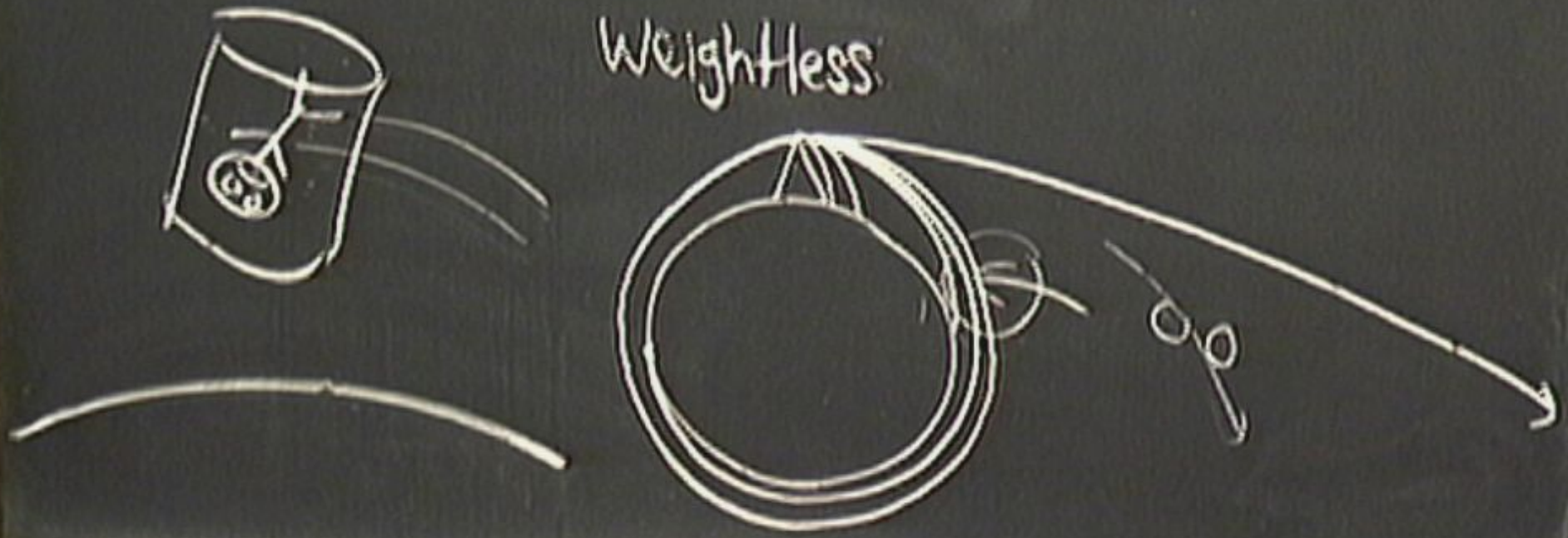

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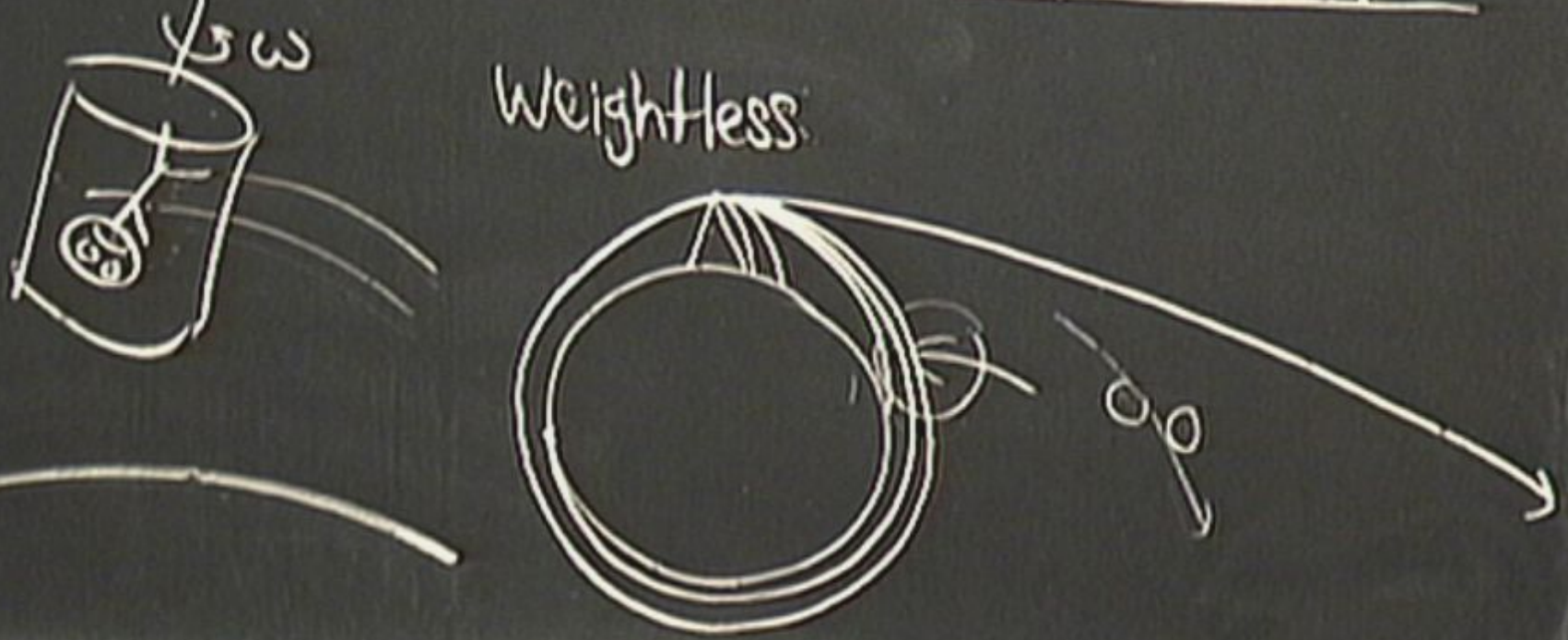

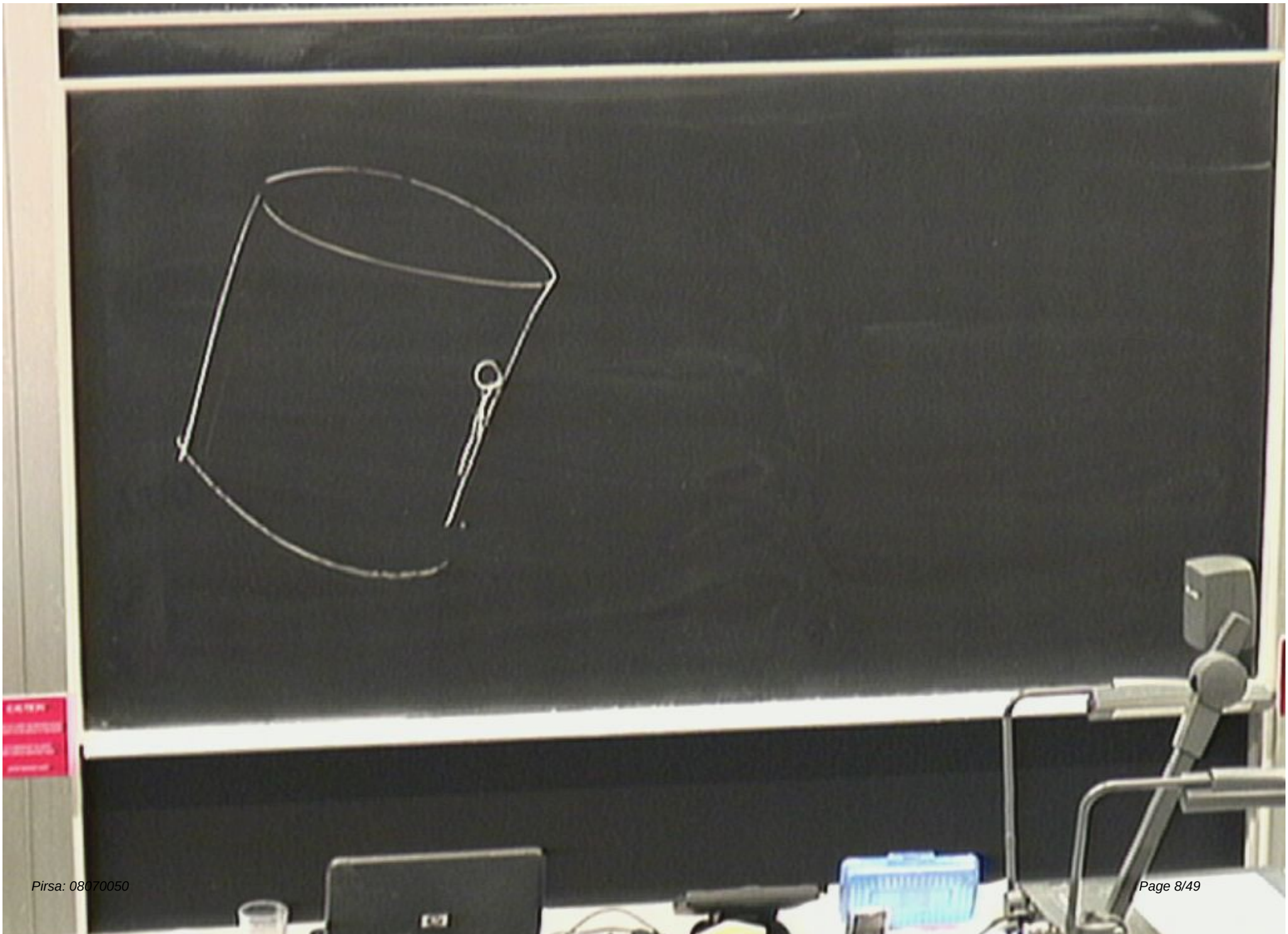

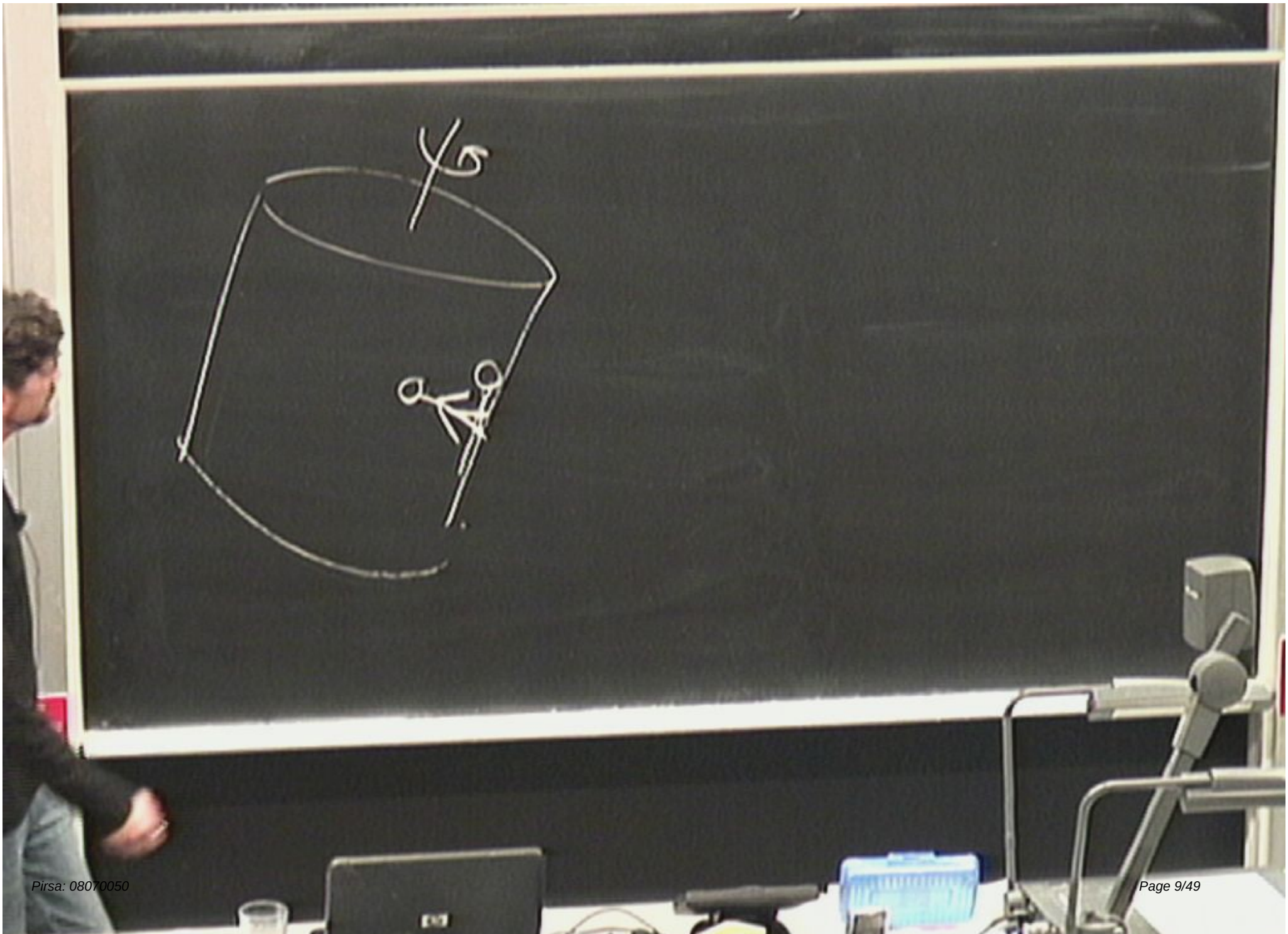

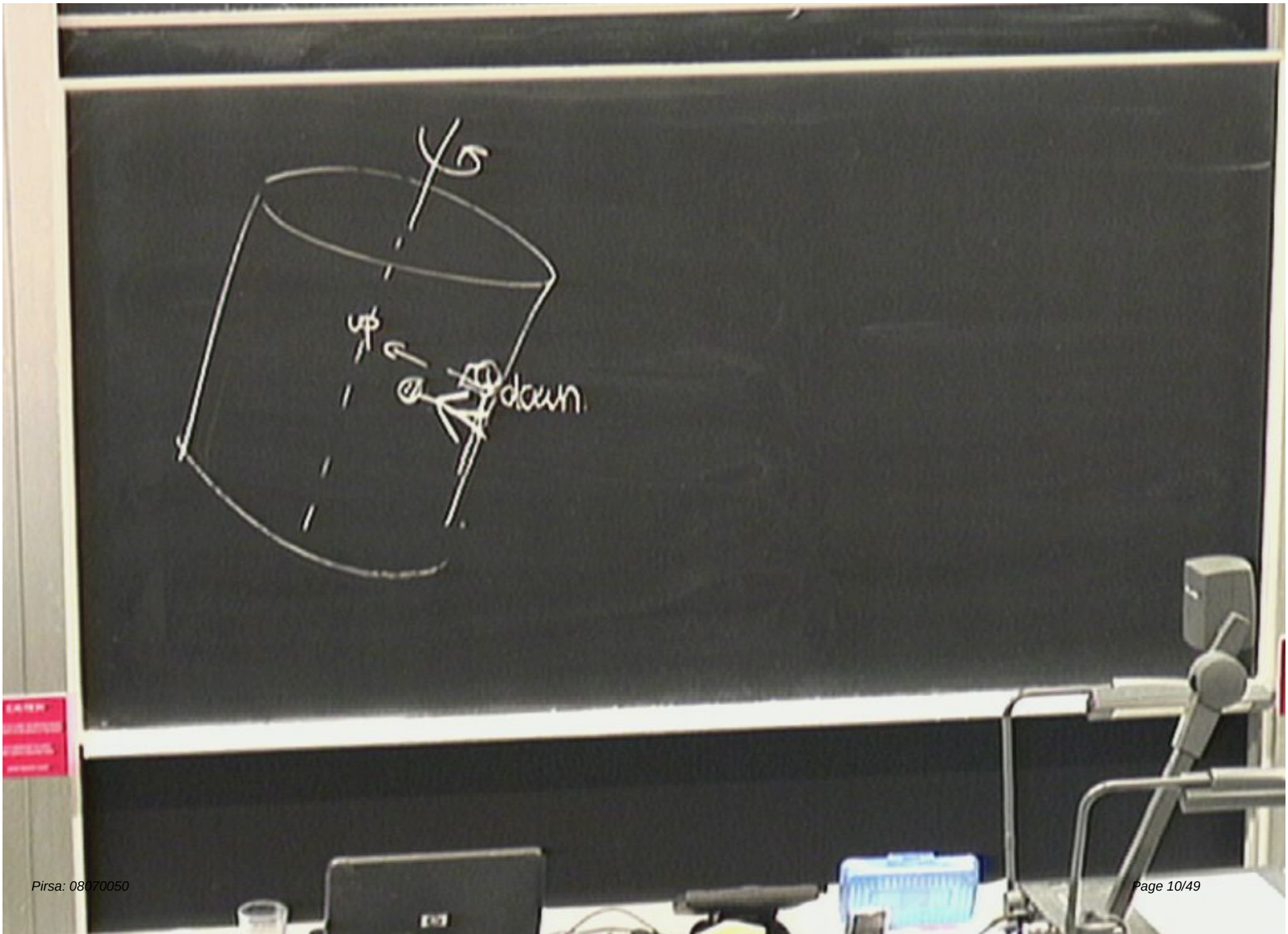
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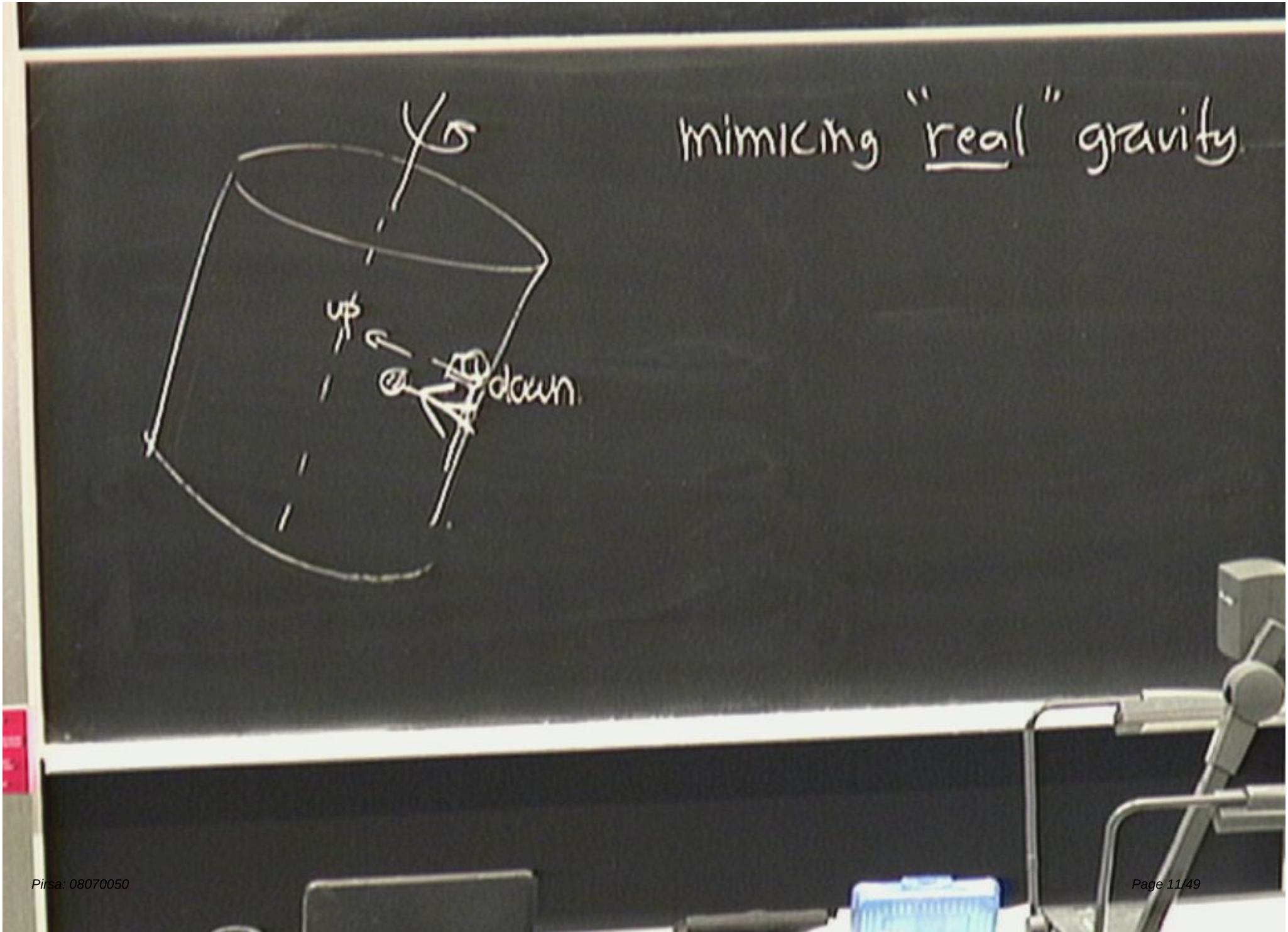
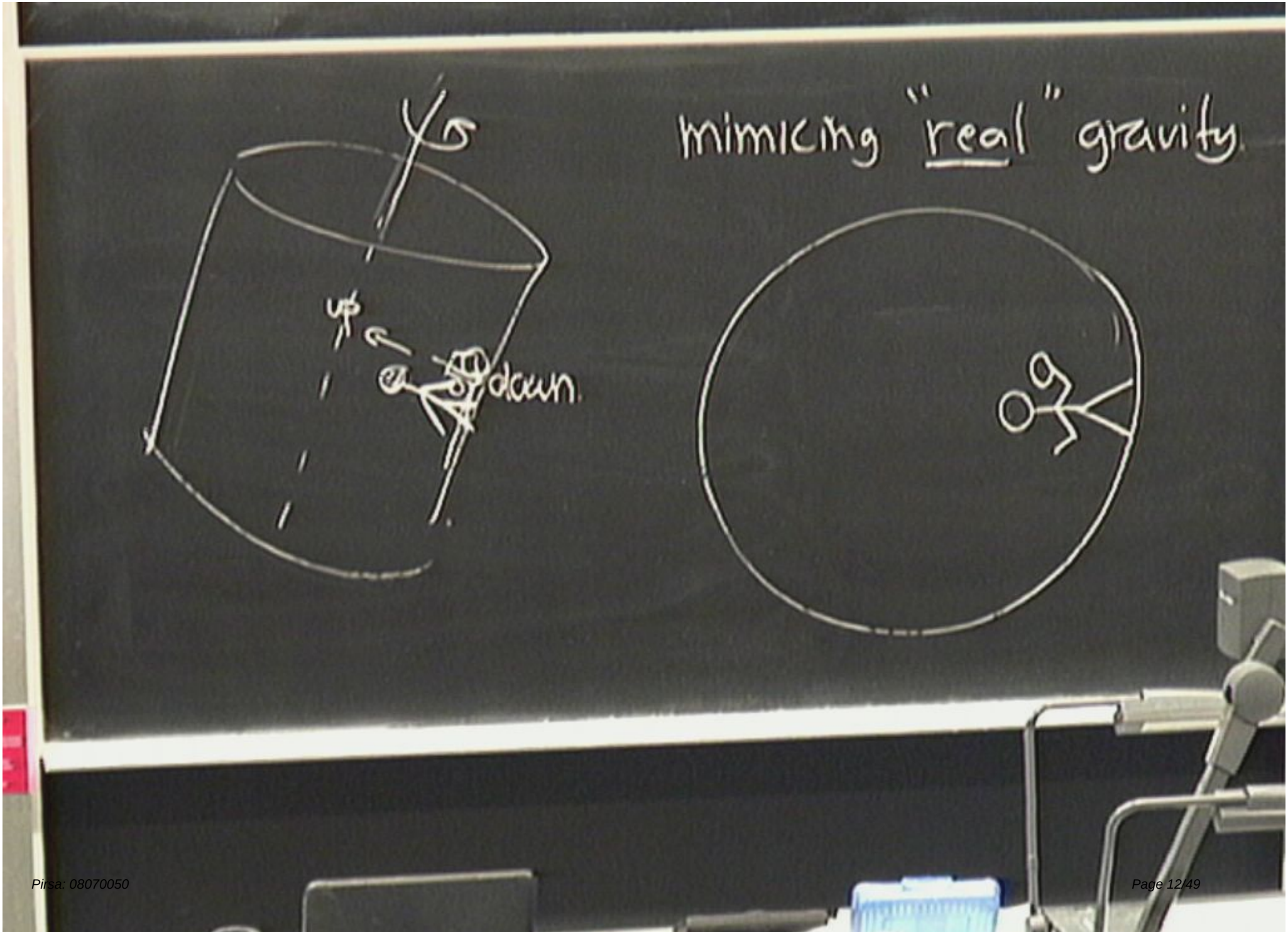

mimicing "real" gravity
up
down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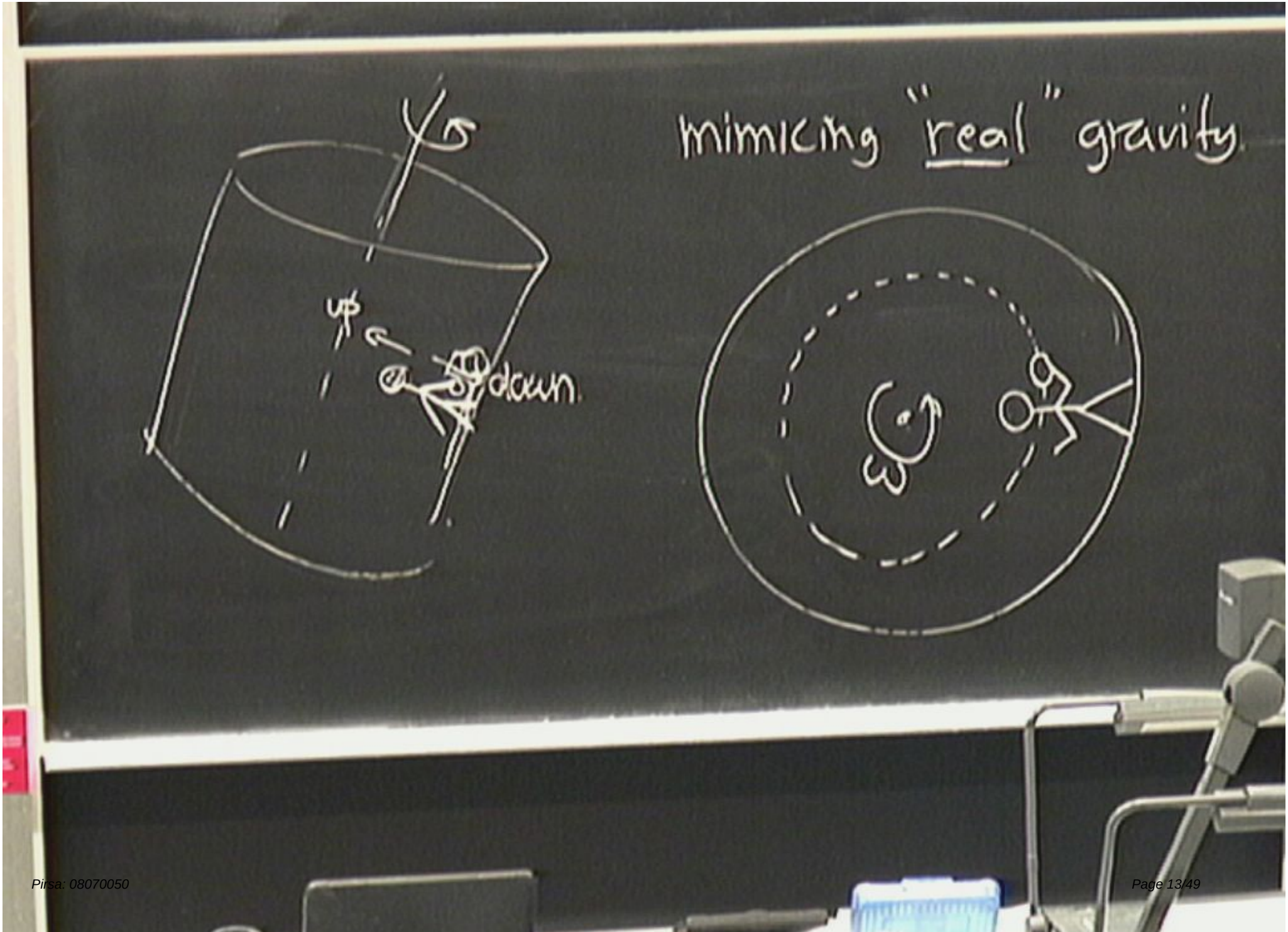
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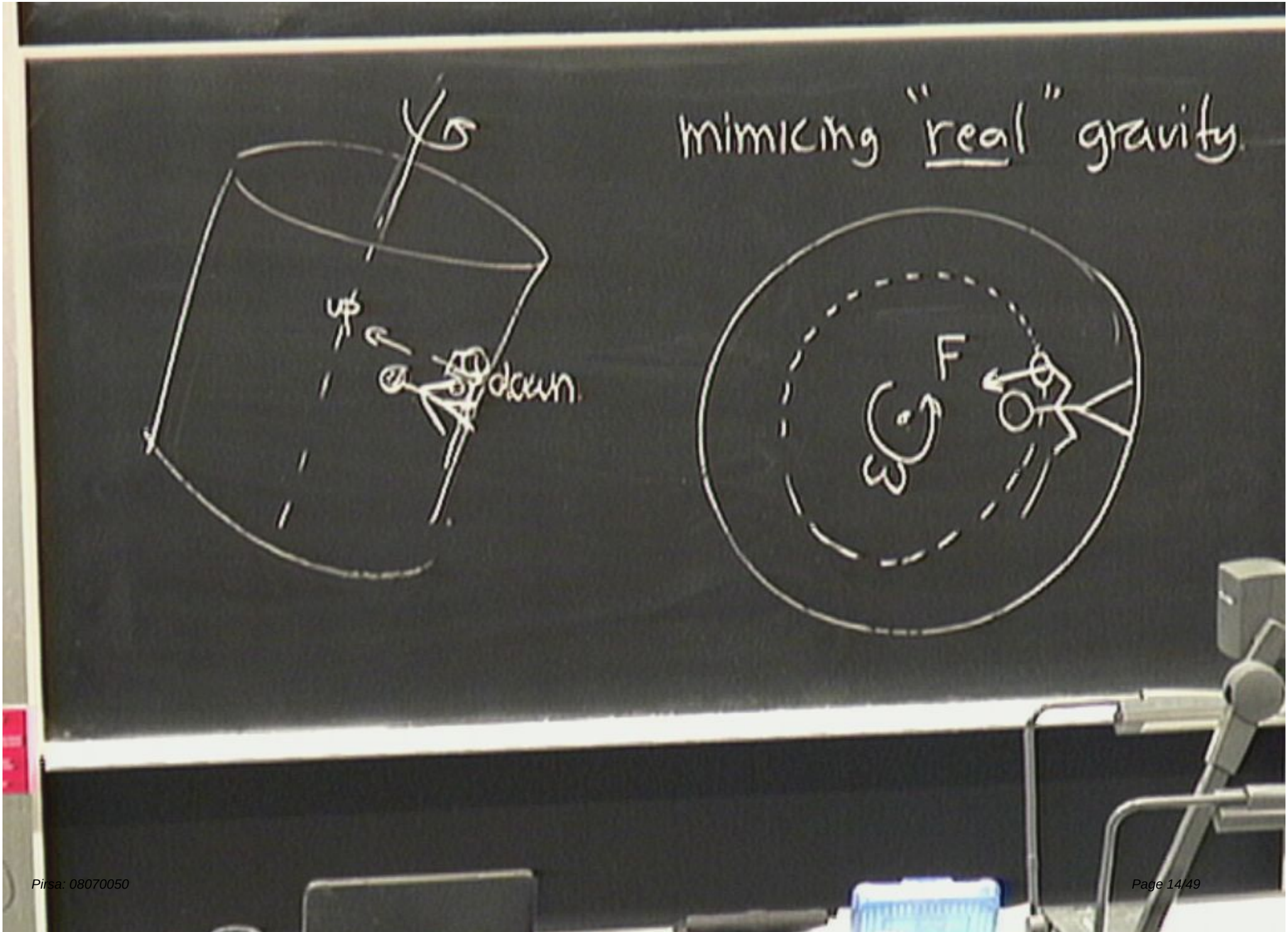
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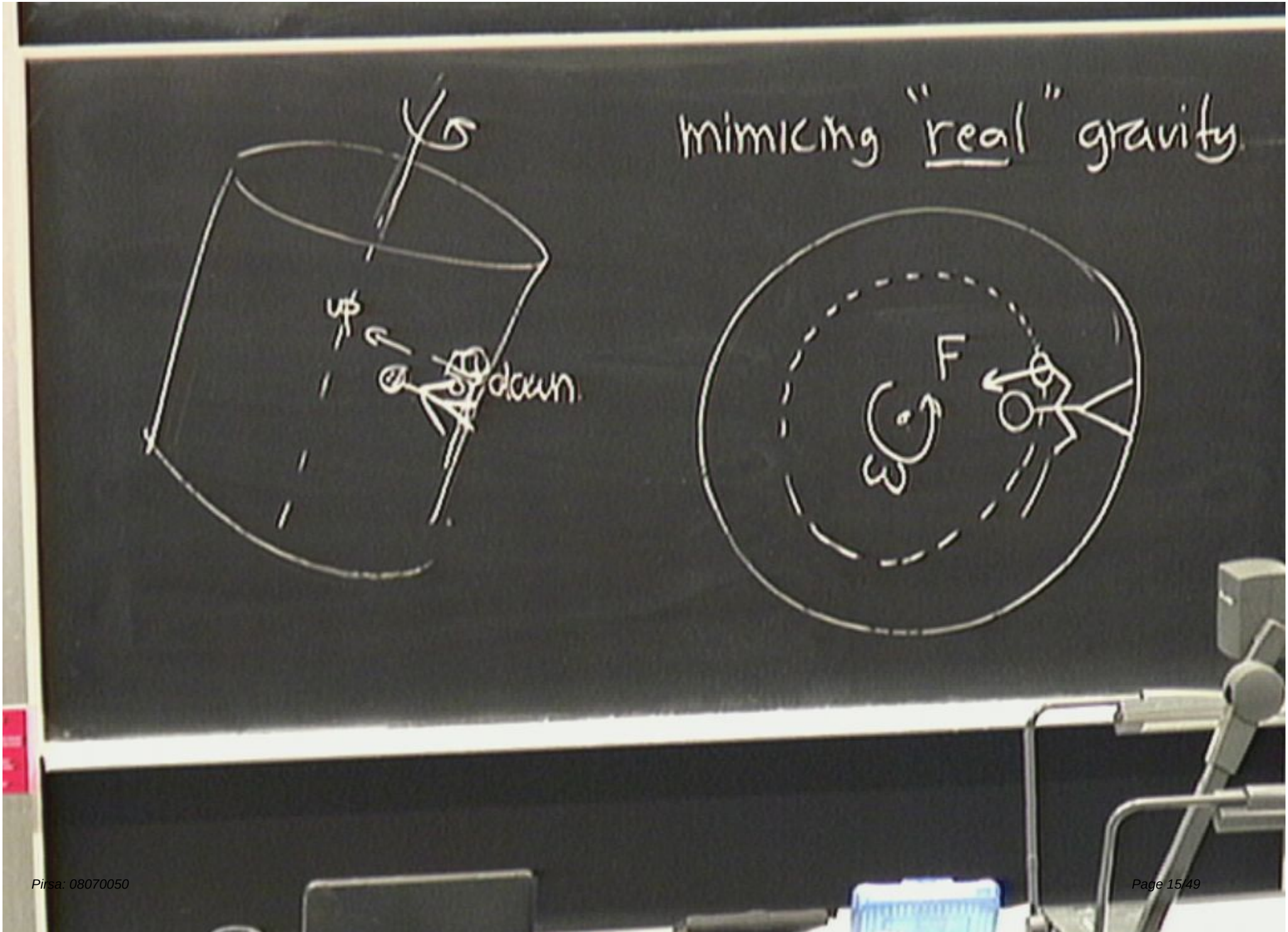
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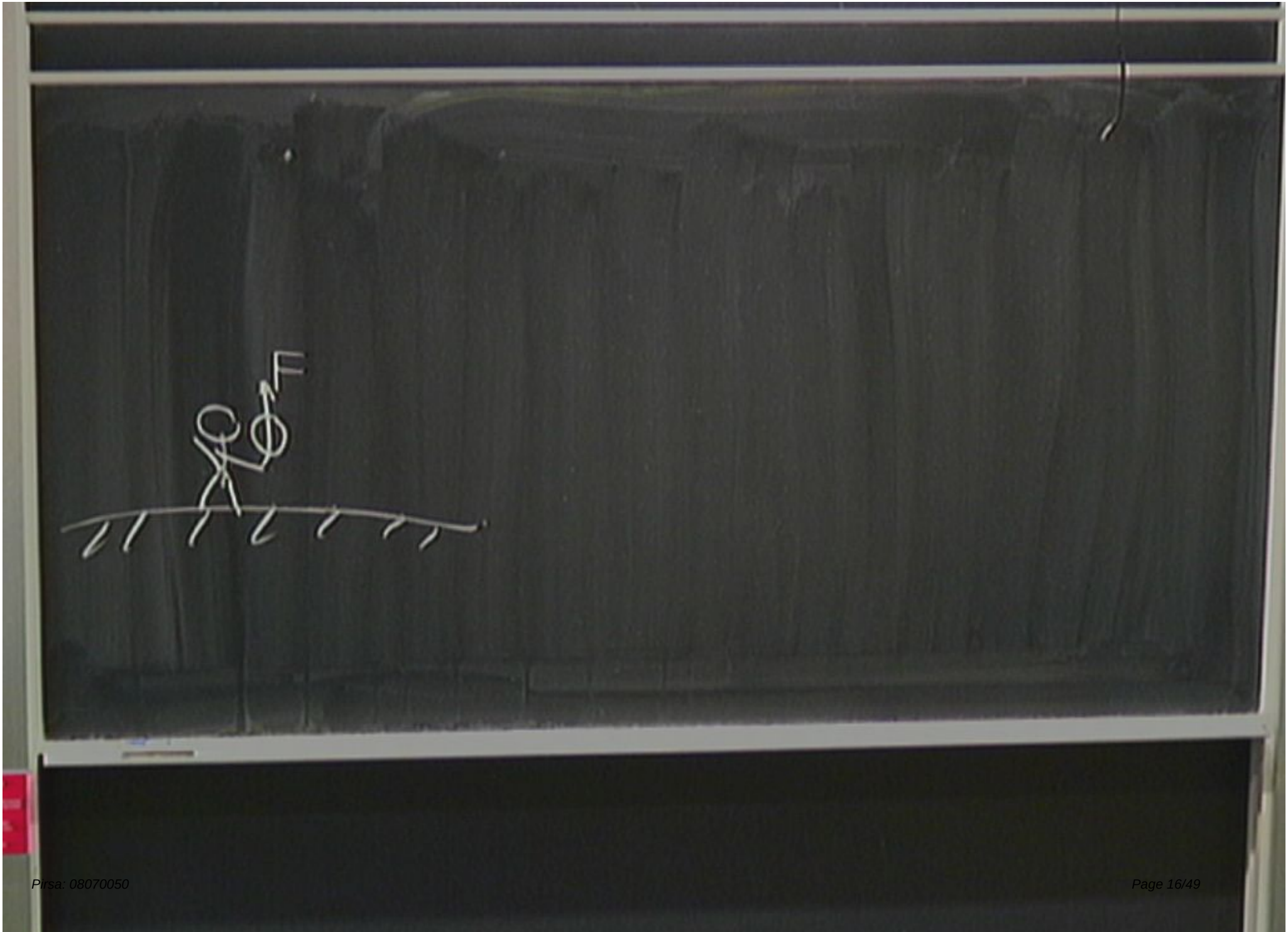
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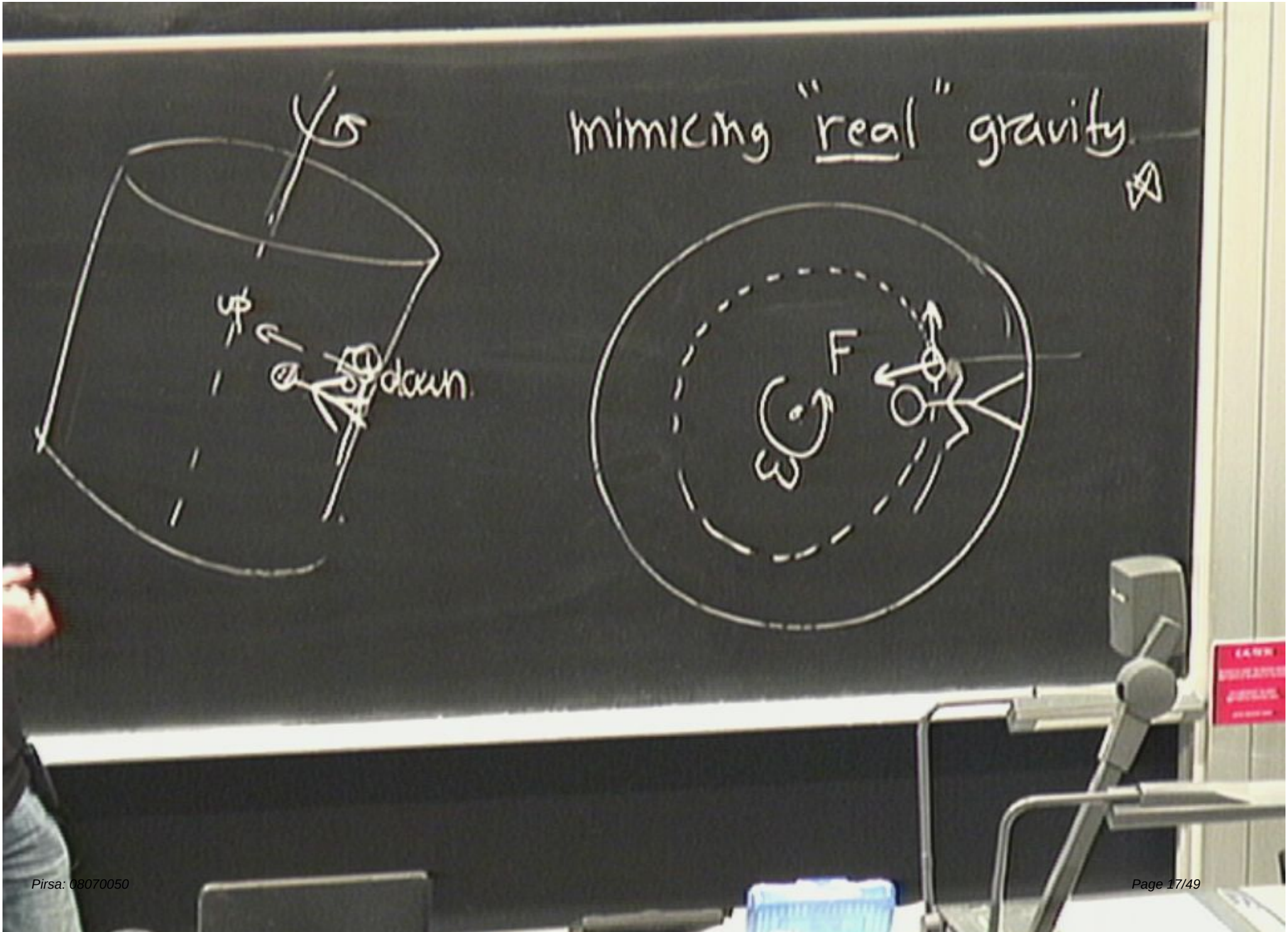
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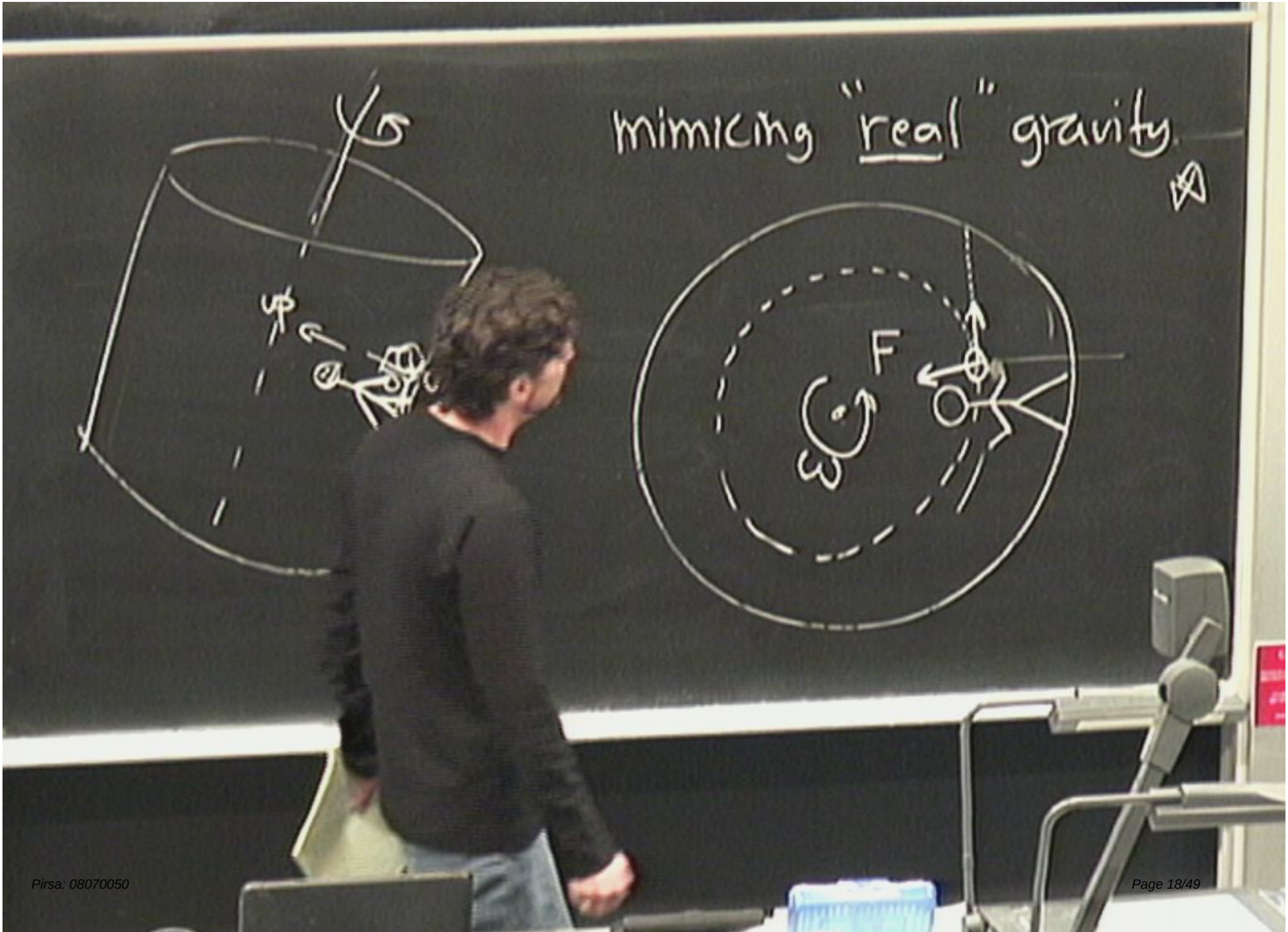
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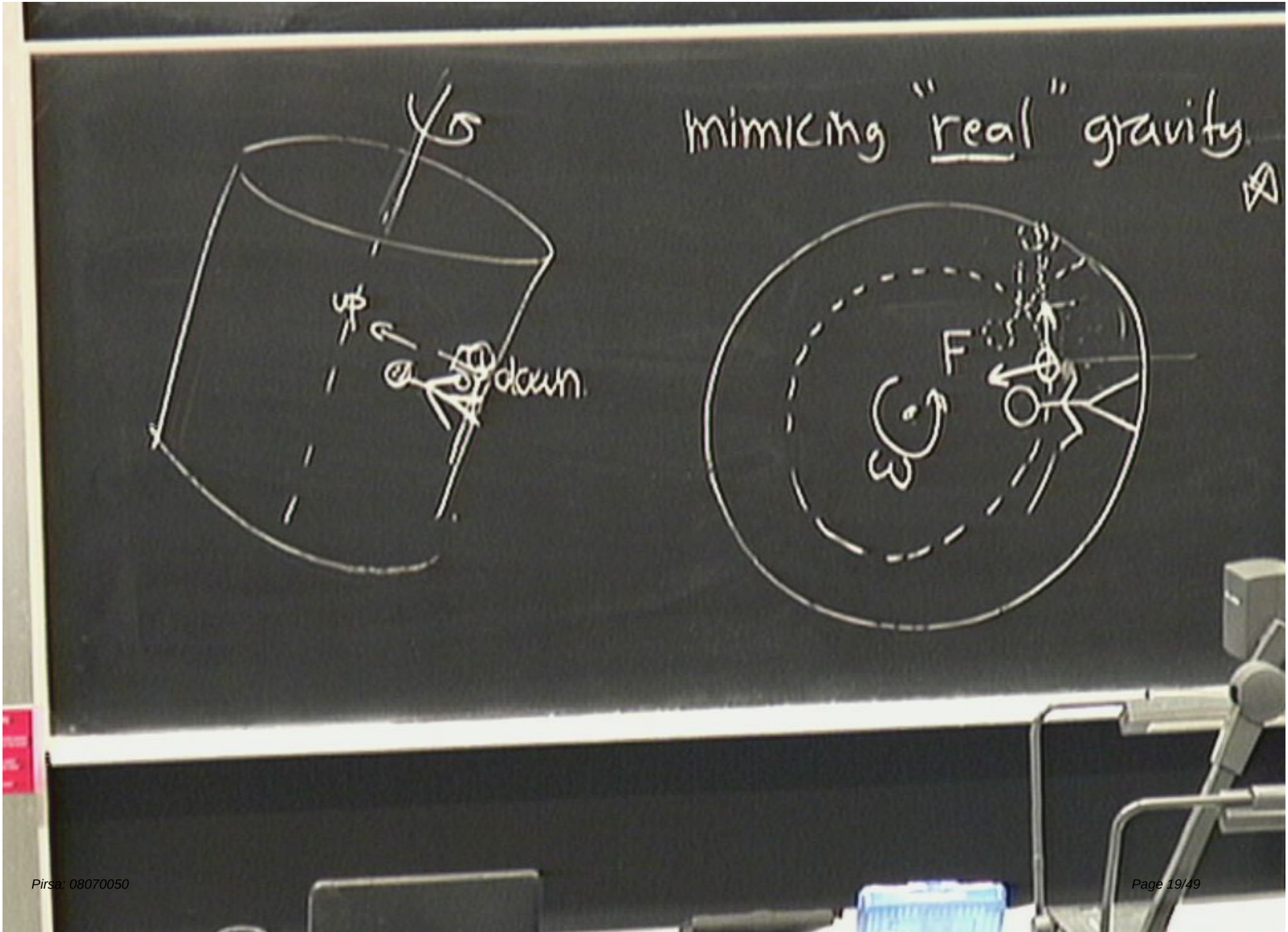
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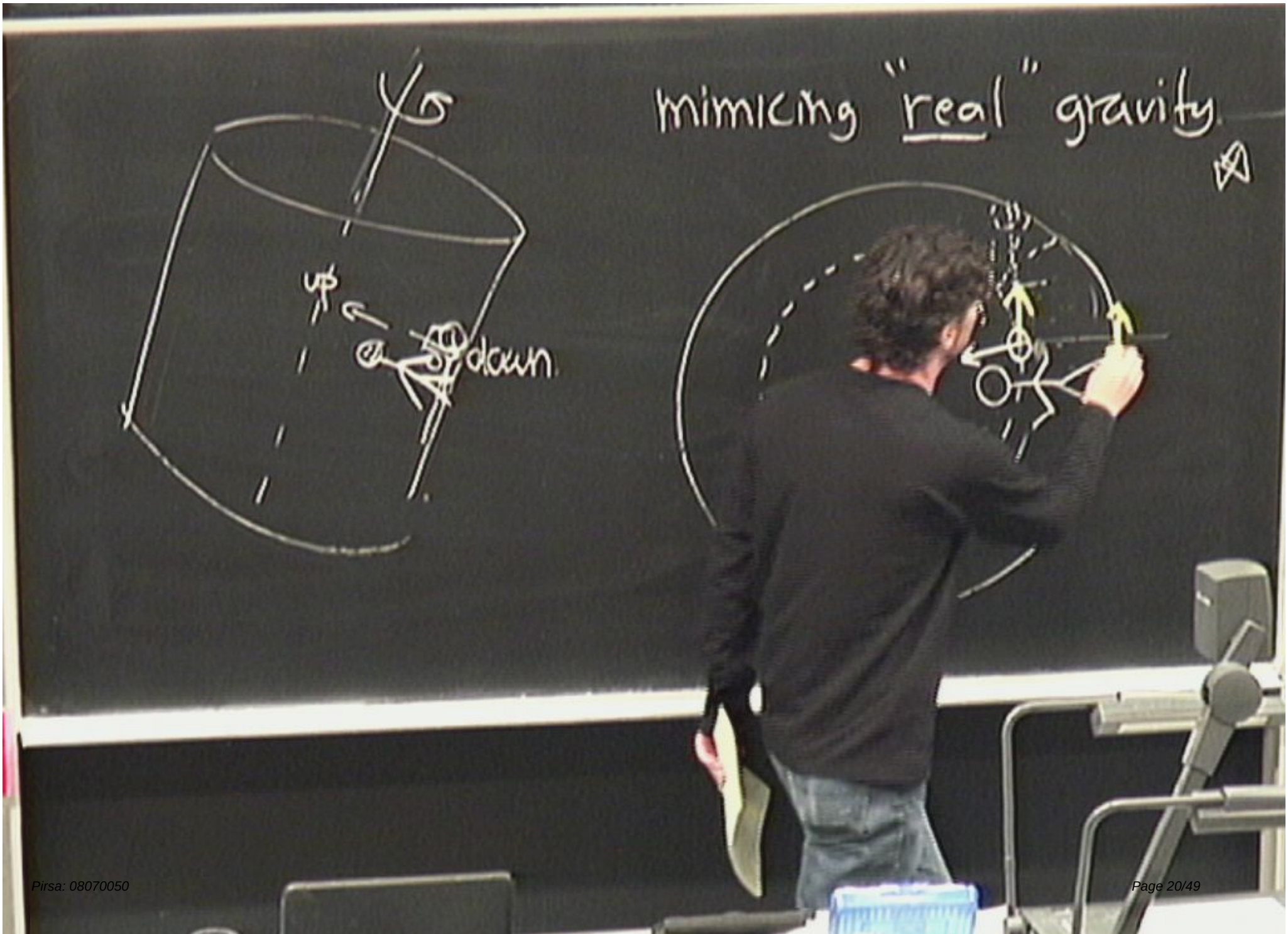
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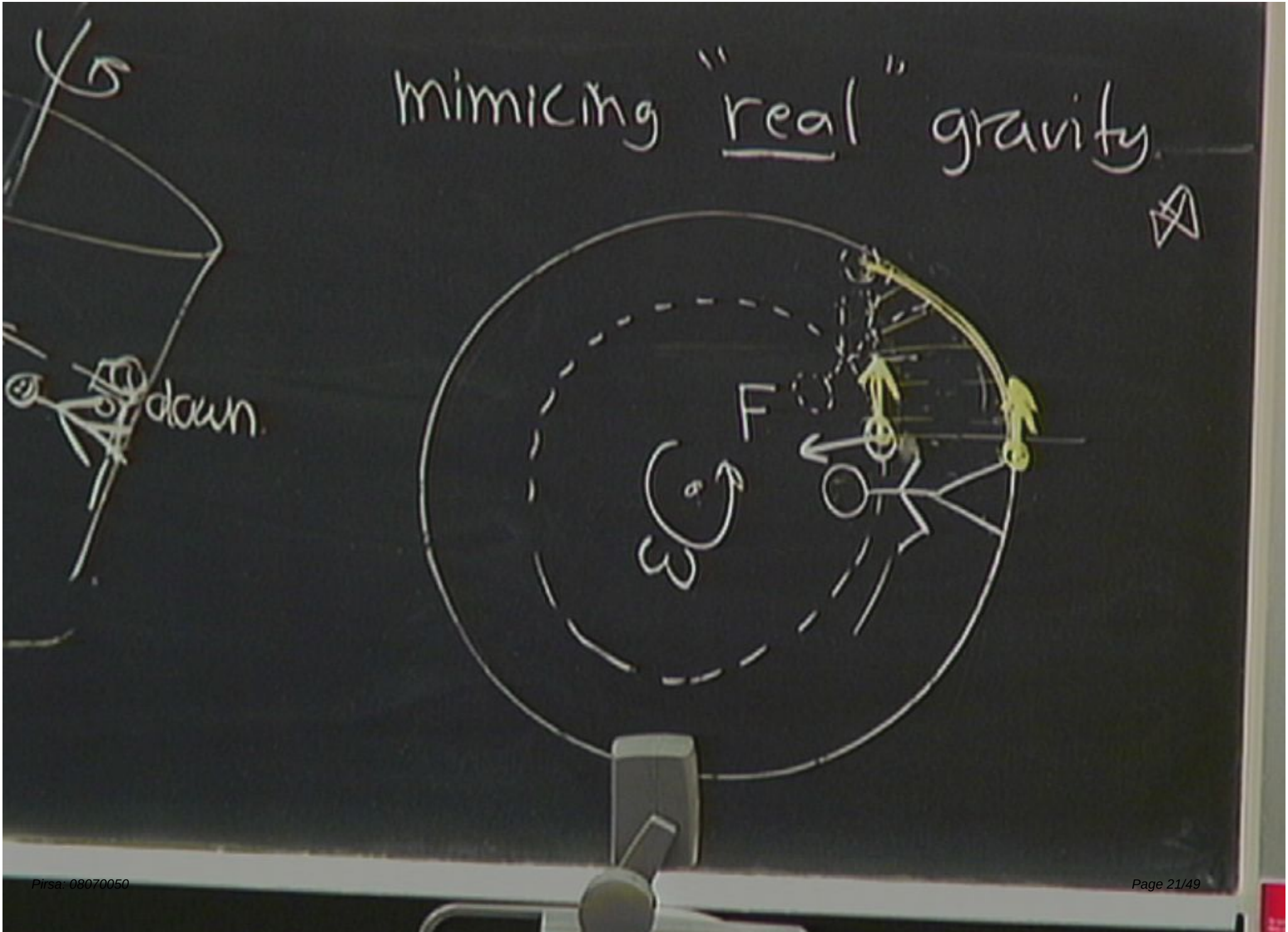
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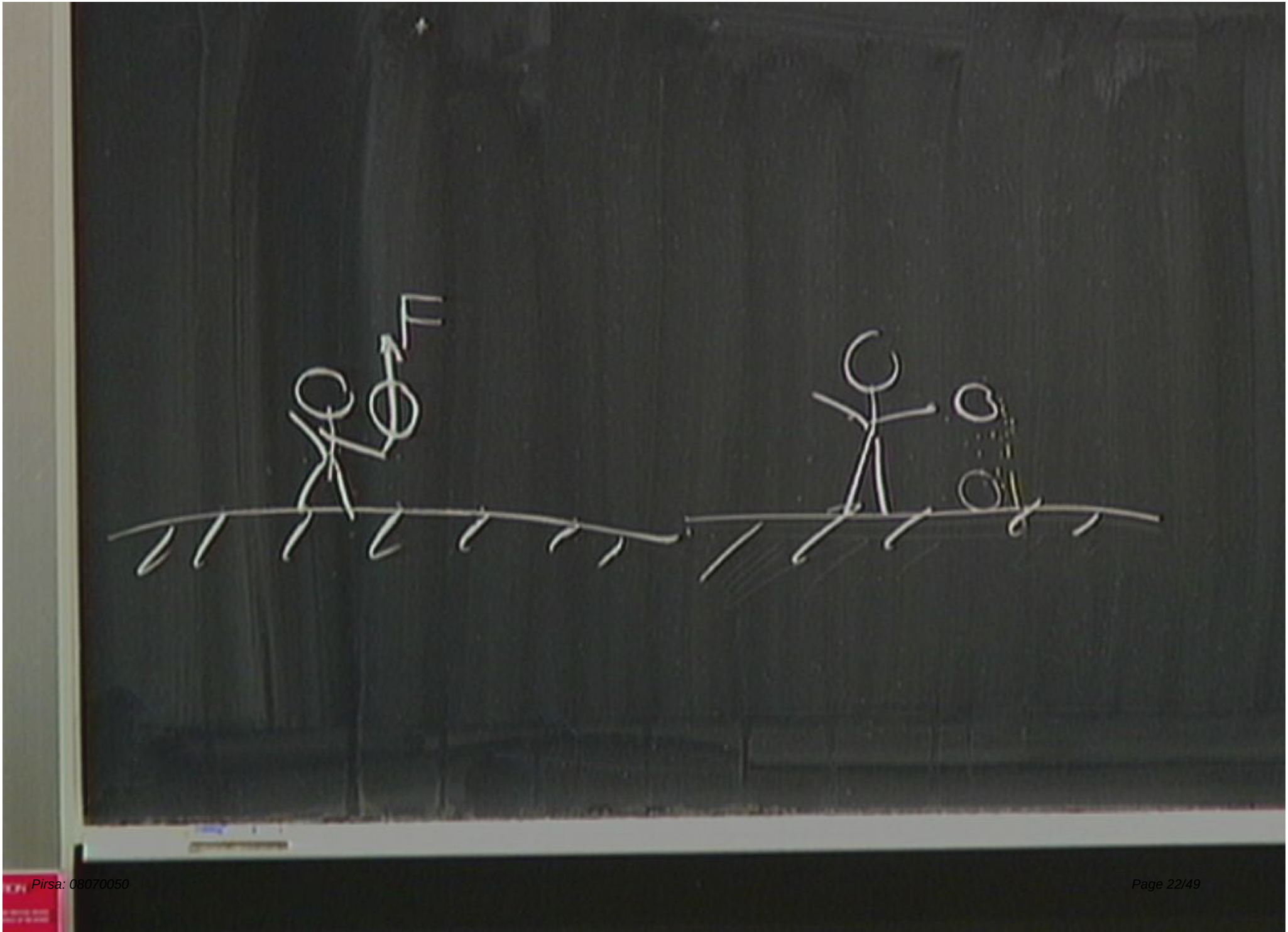
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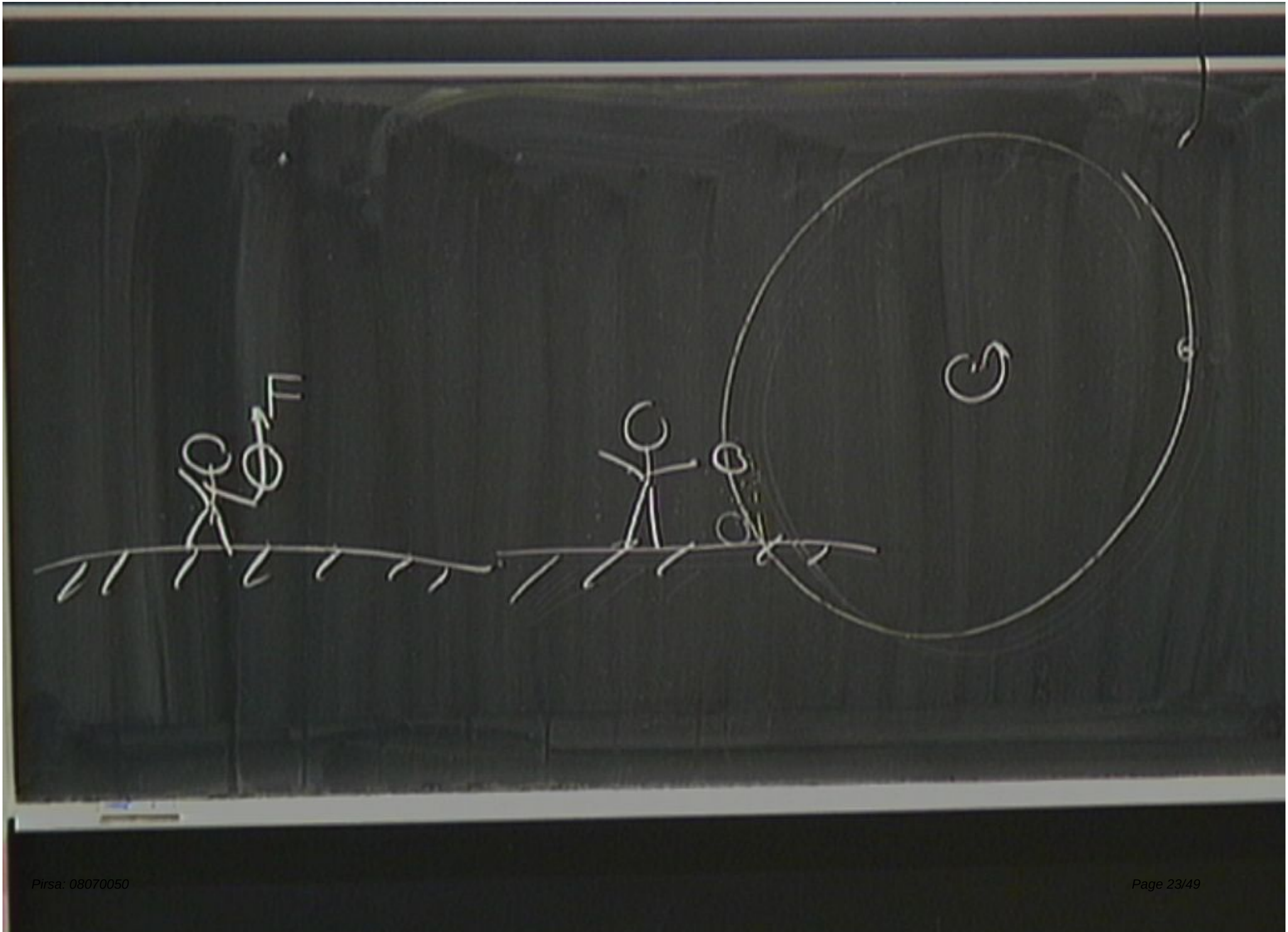
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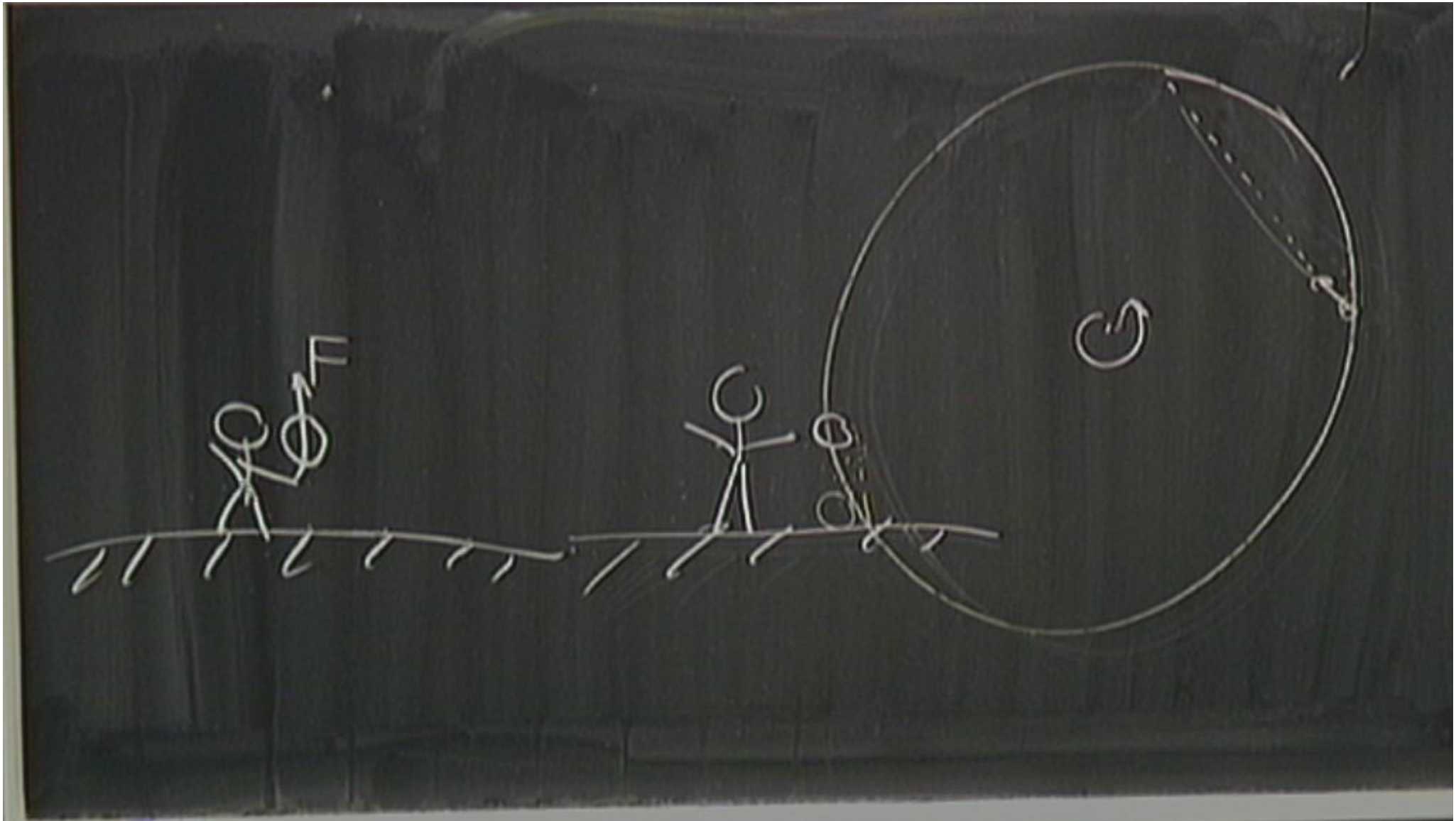
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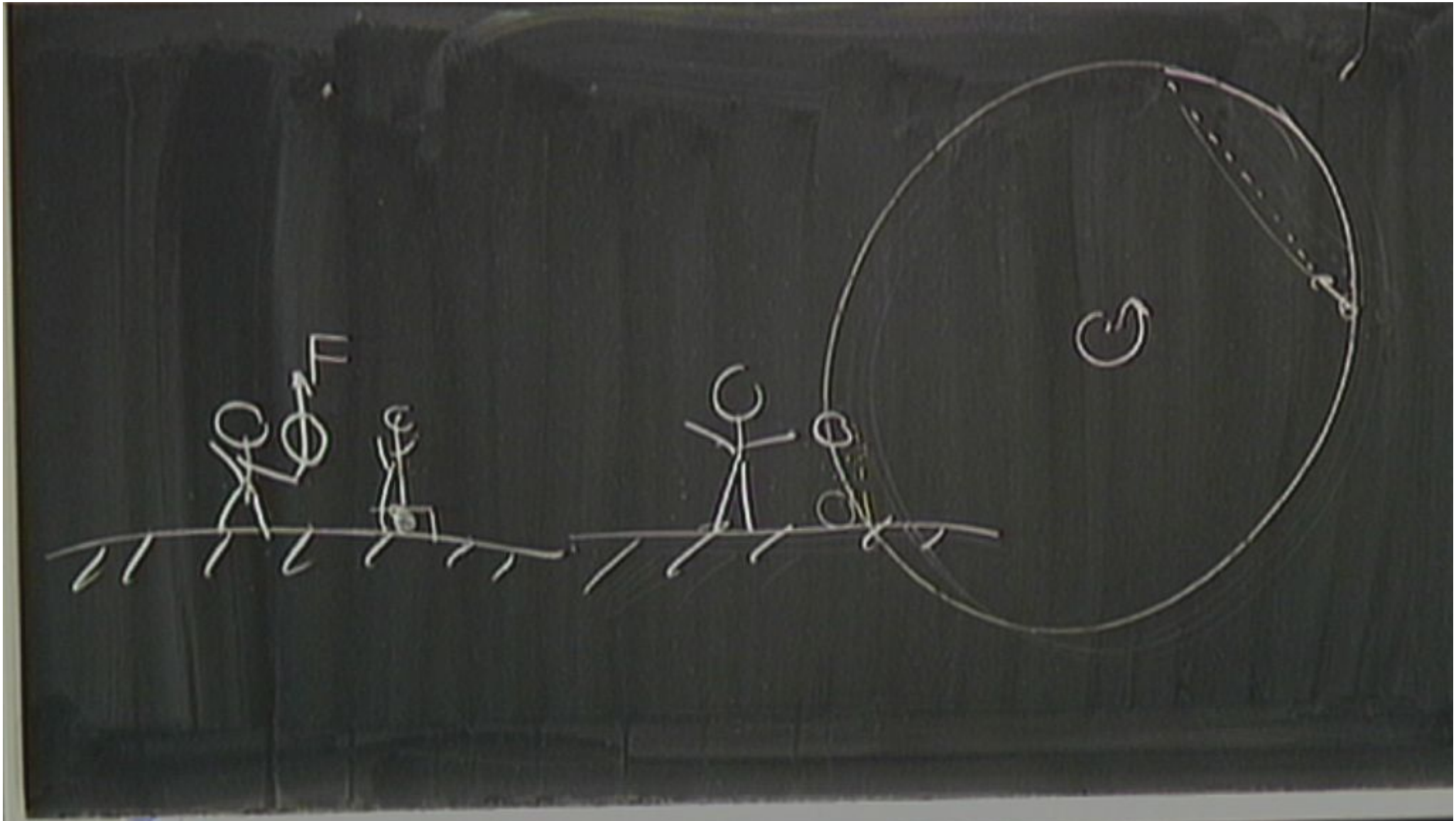
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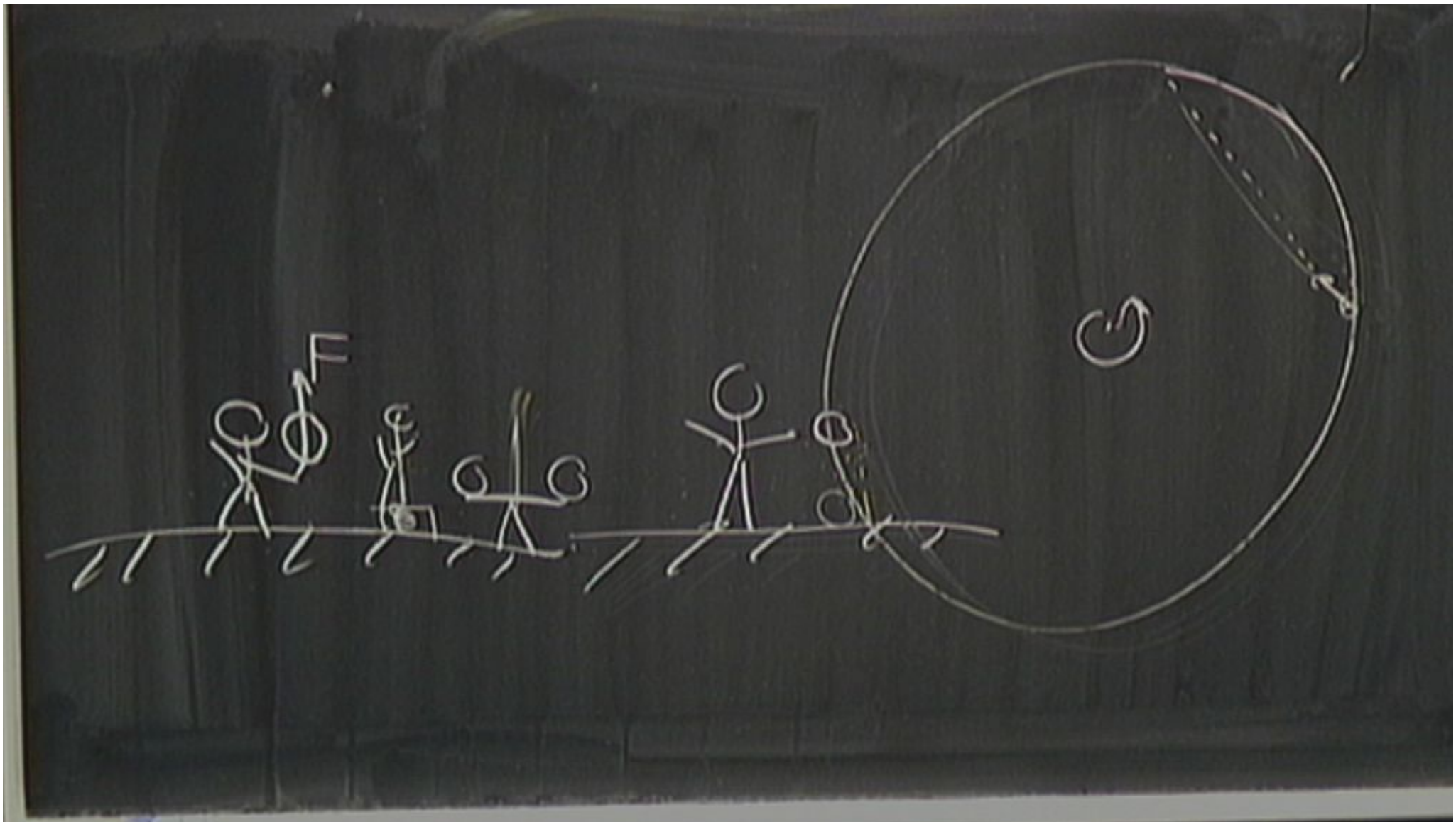
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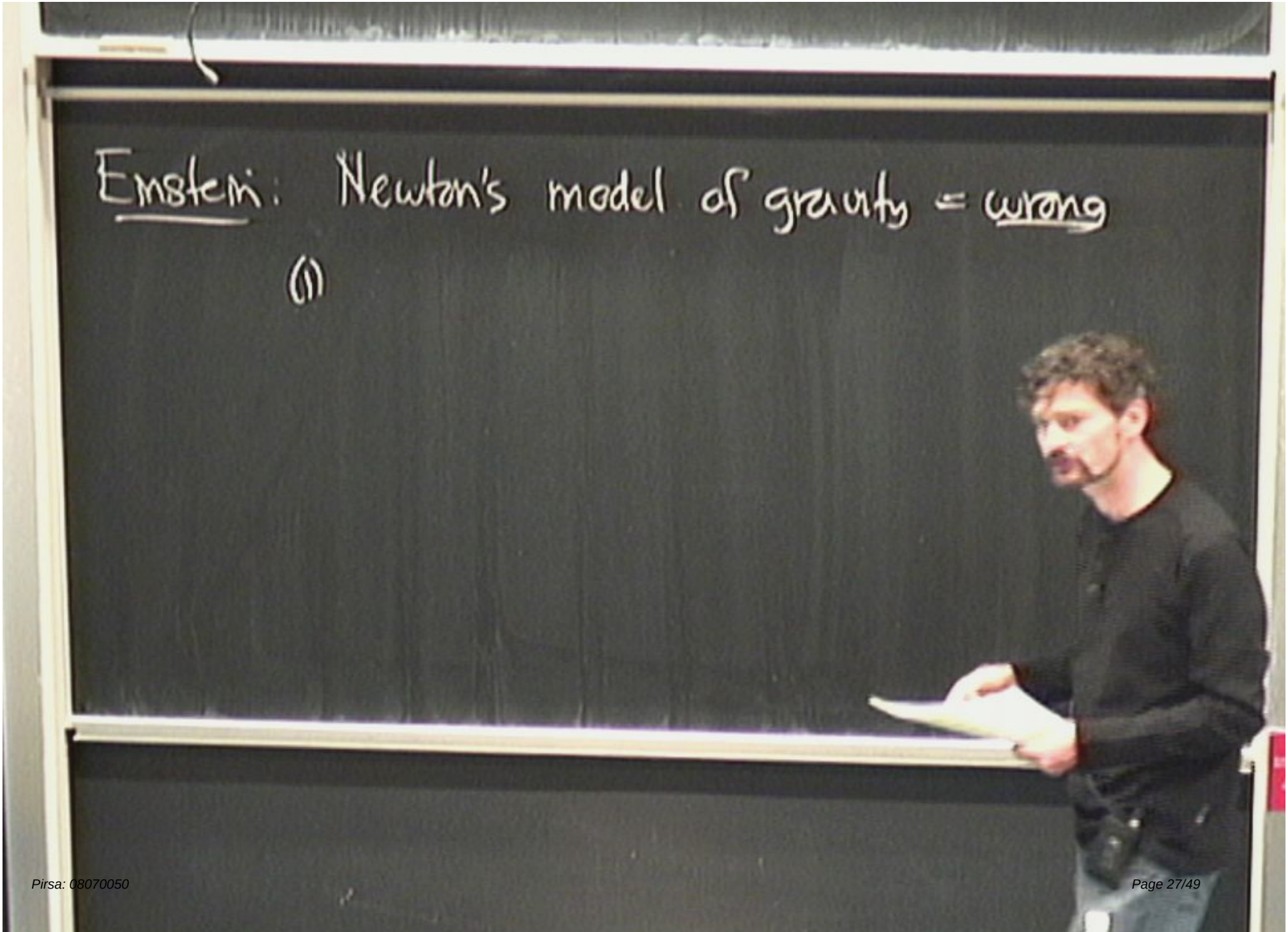
Einstein: Newton's model of gravity = wrong
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(1) Theory: ∃ c = speed limit

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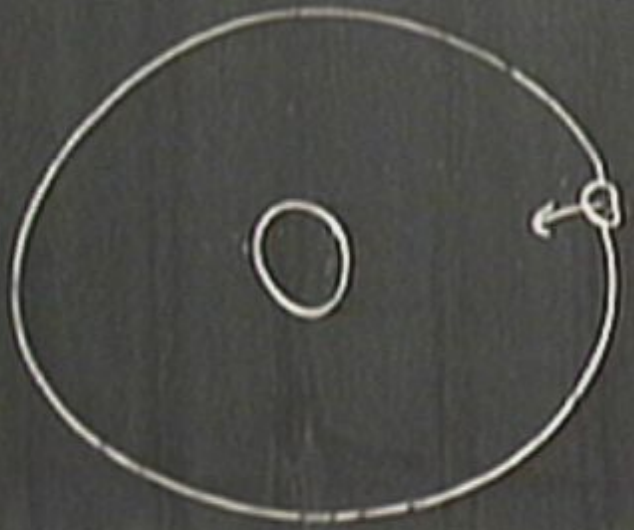

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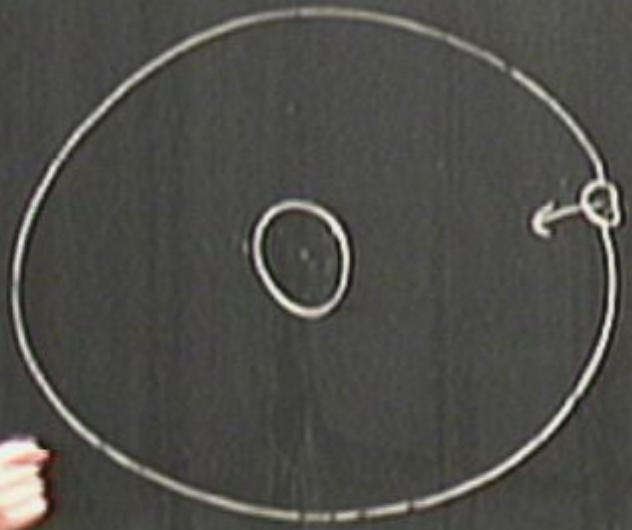

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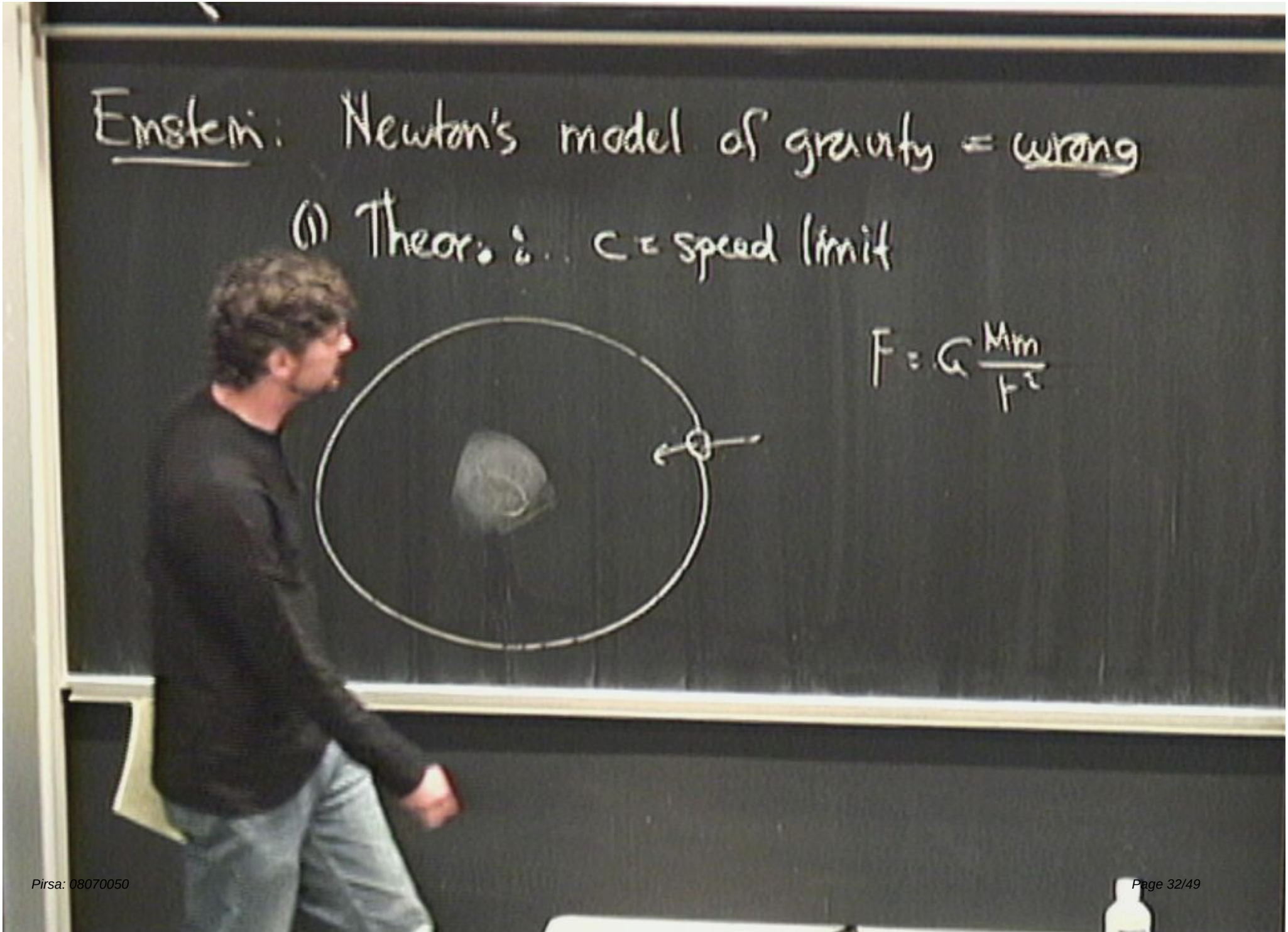
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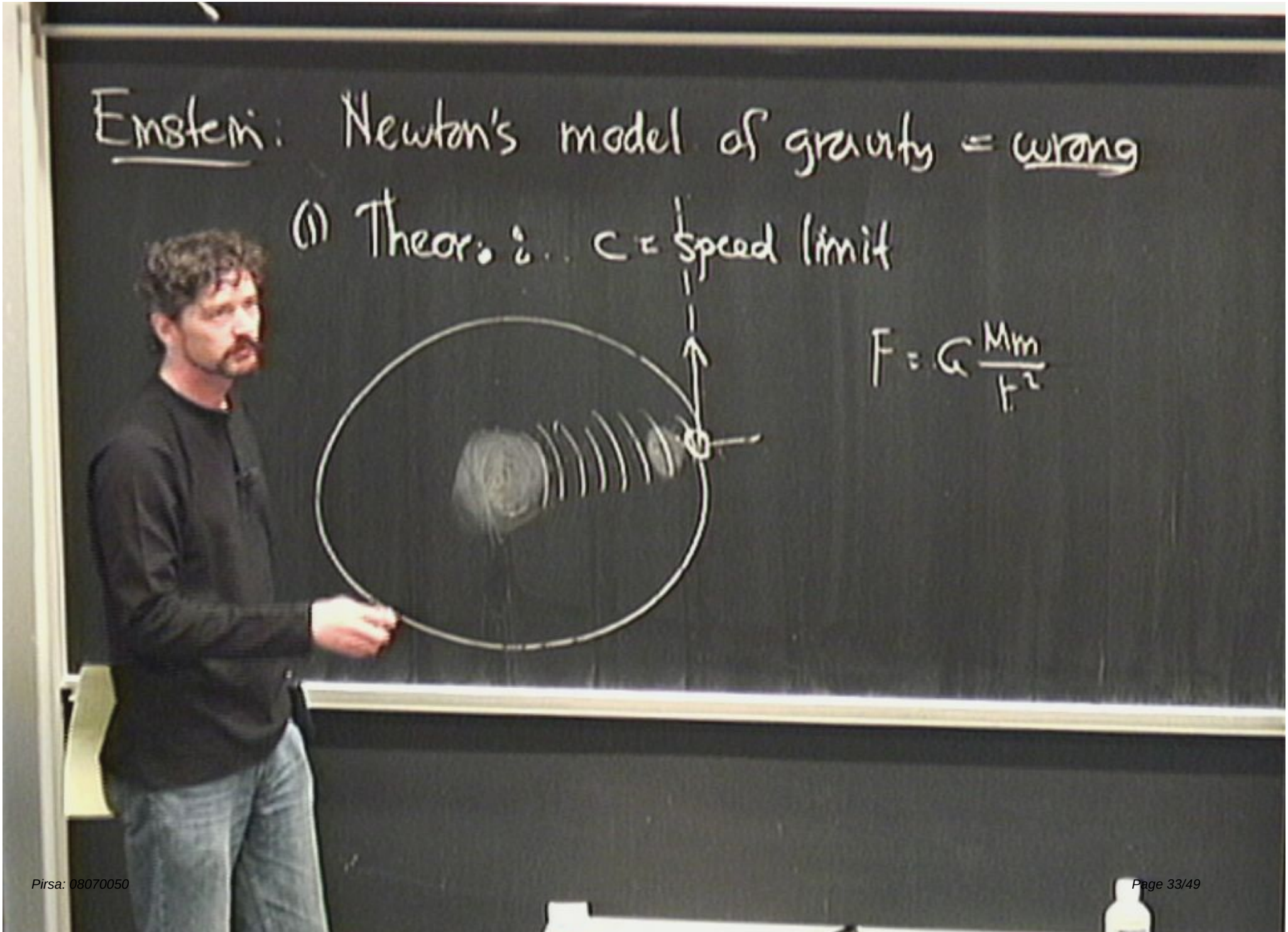
$F = G\frac{Mm}{r^2}$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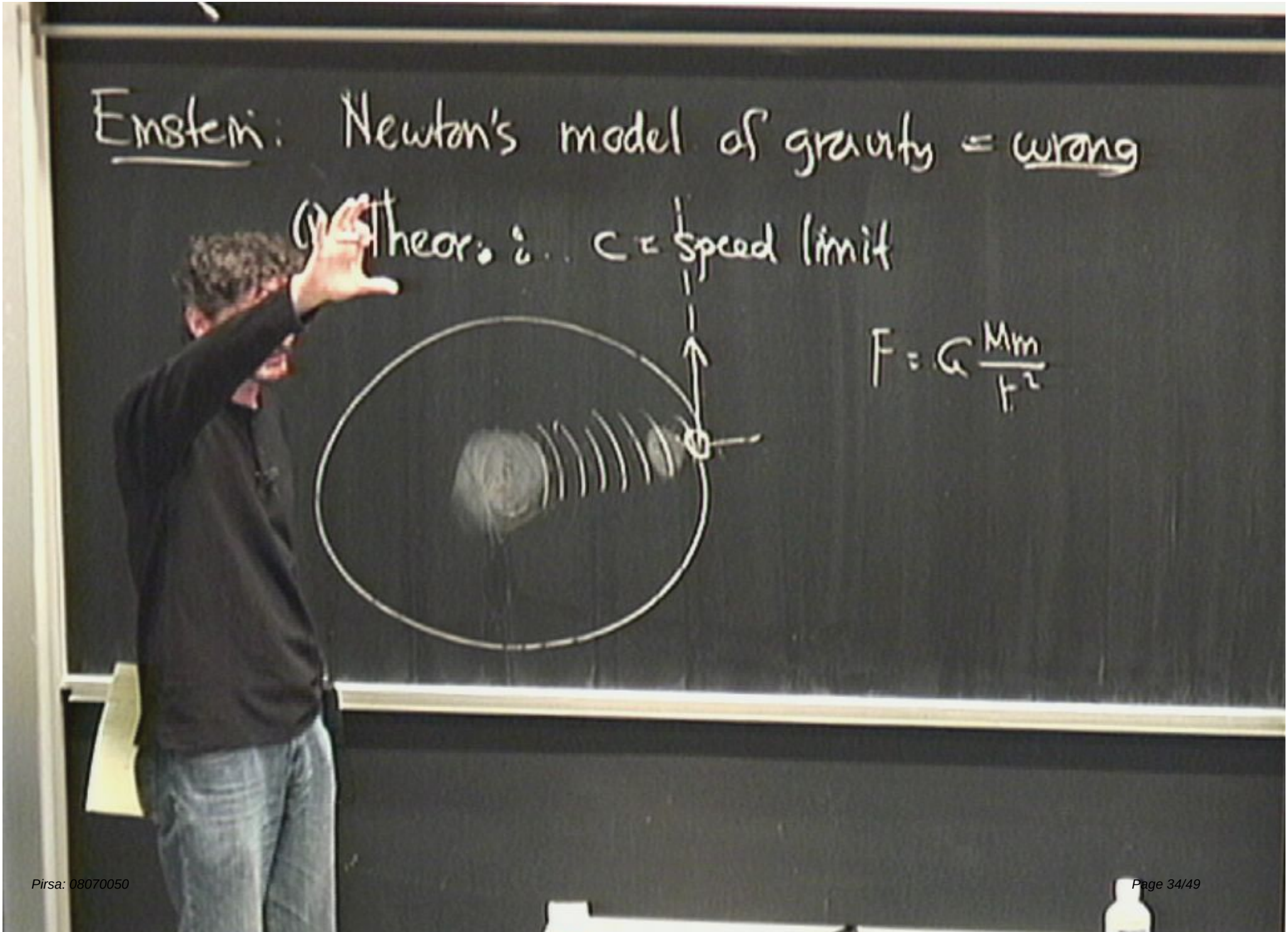
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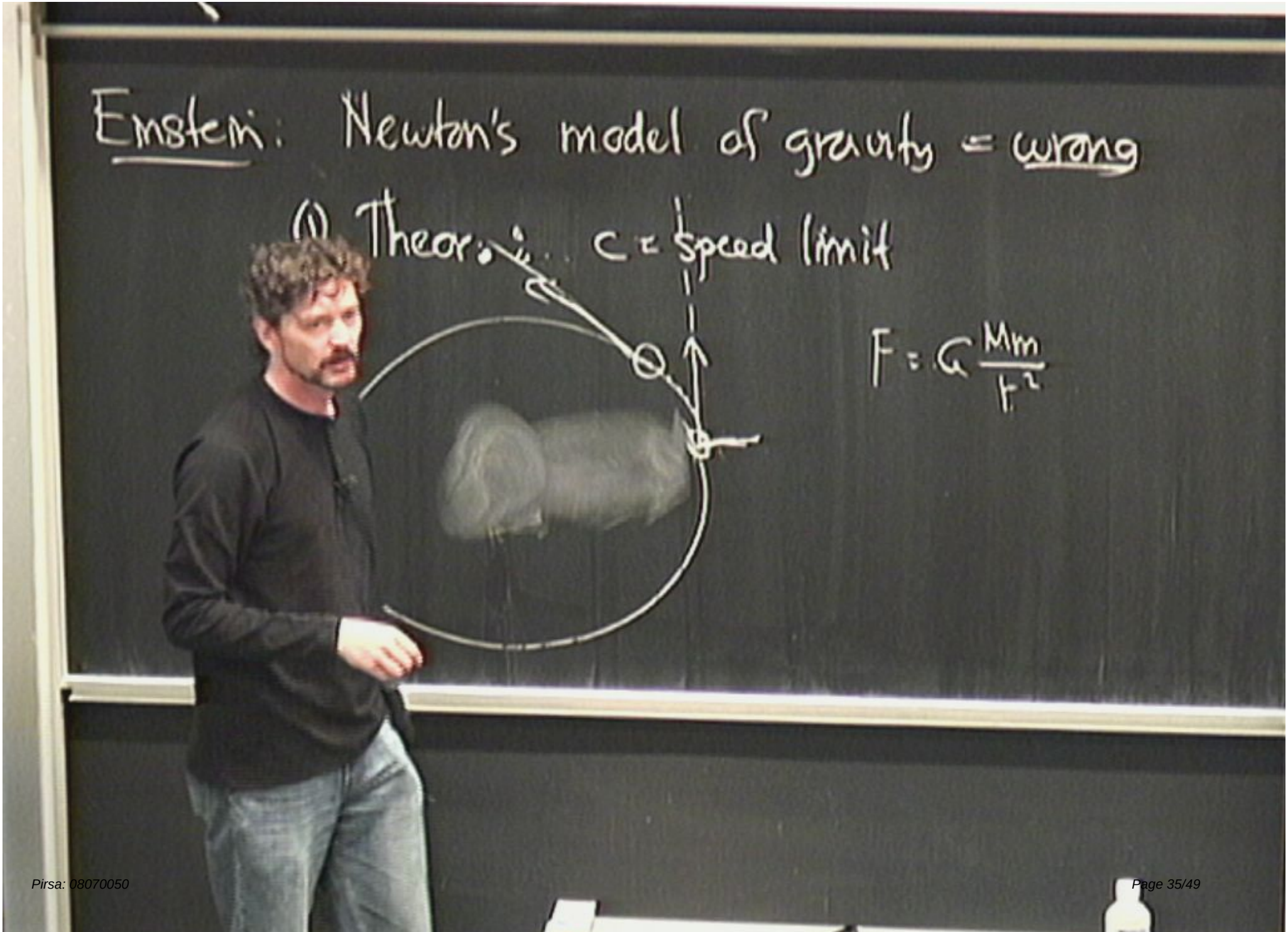
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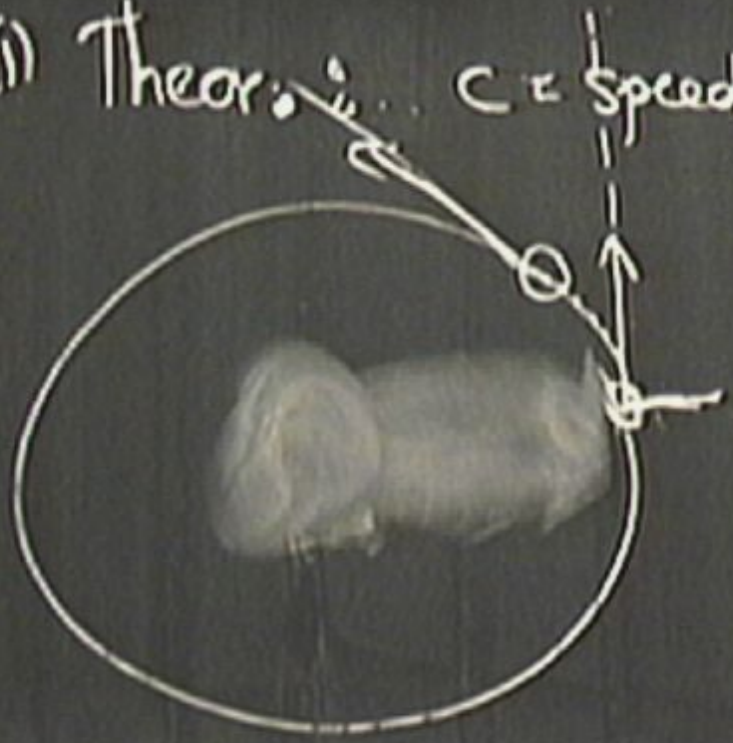
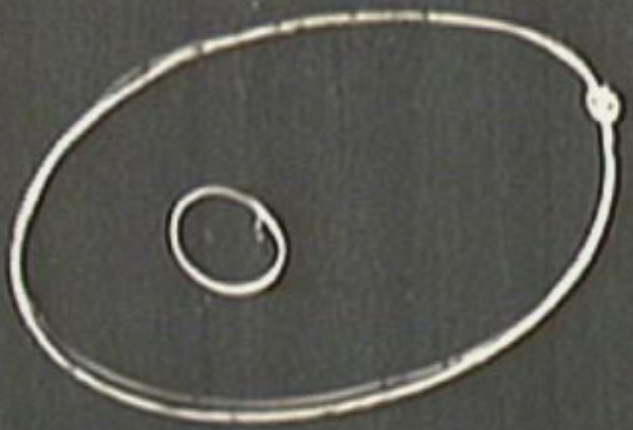


$$F = G\frac{Mm}{r^2}$$

(2) Expt.: Mercury.



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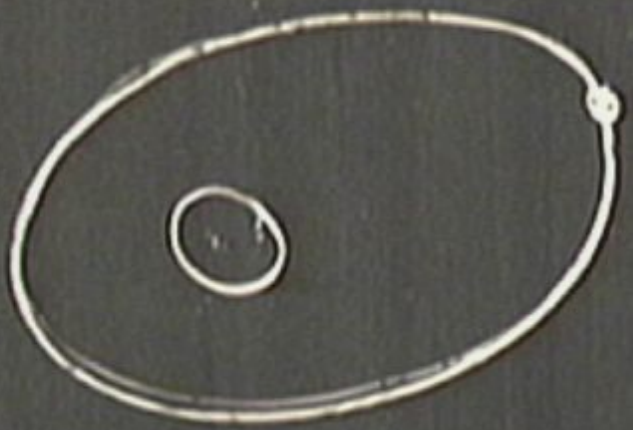

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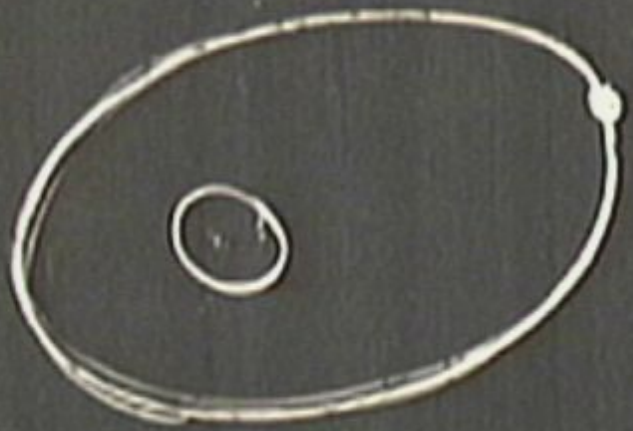

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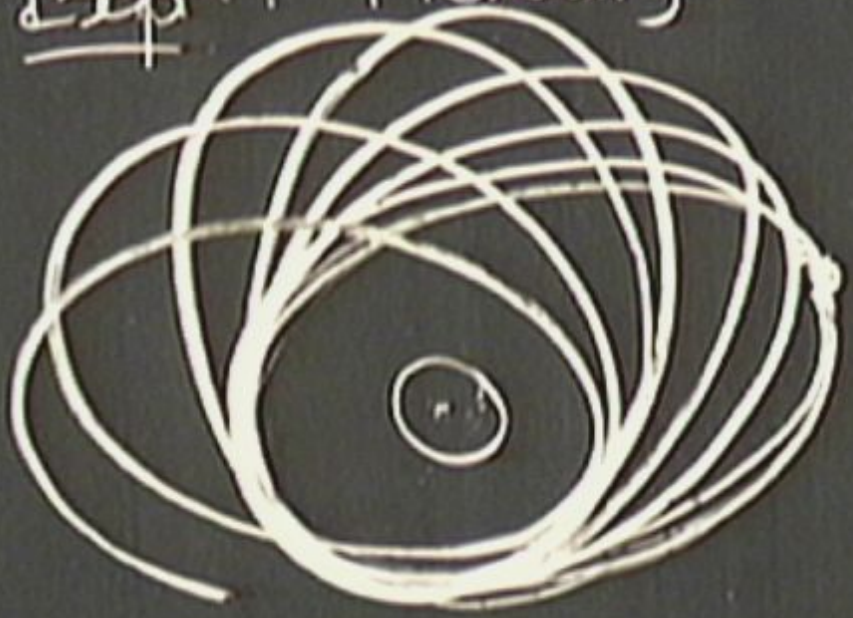

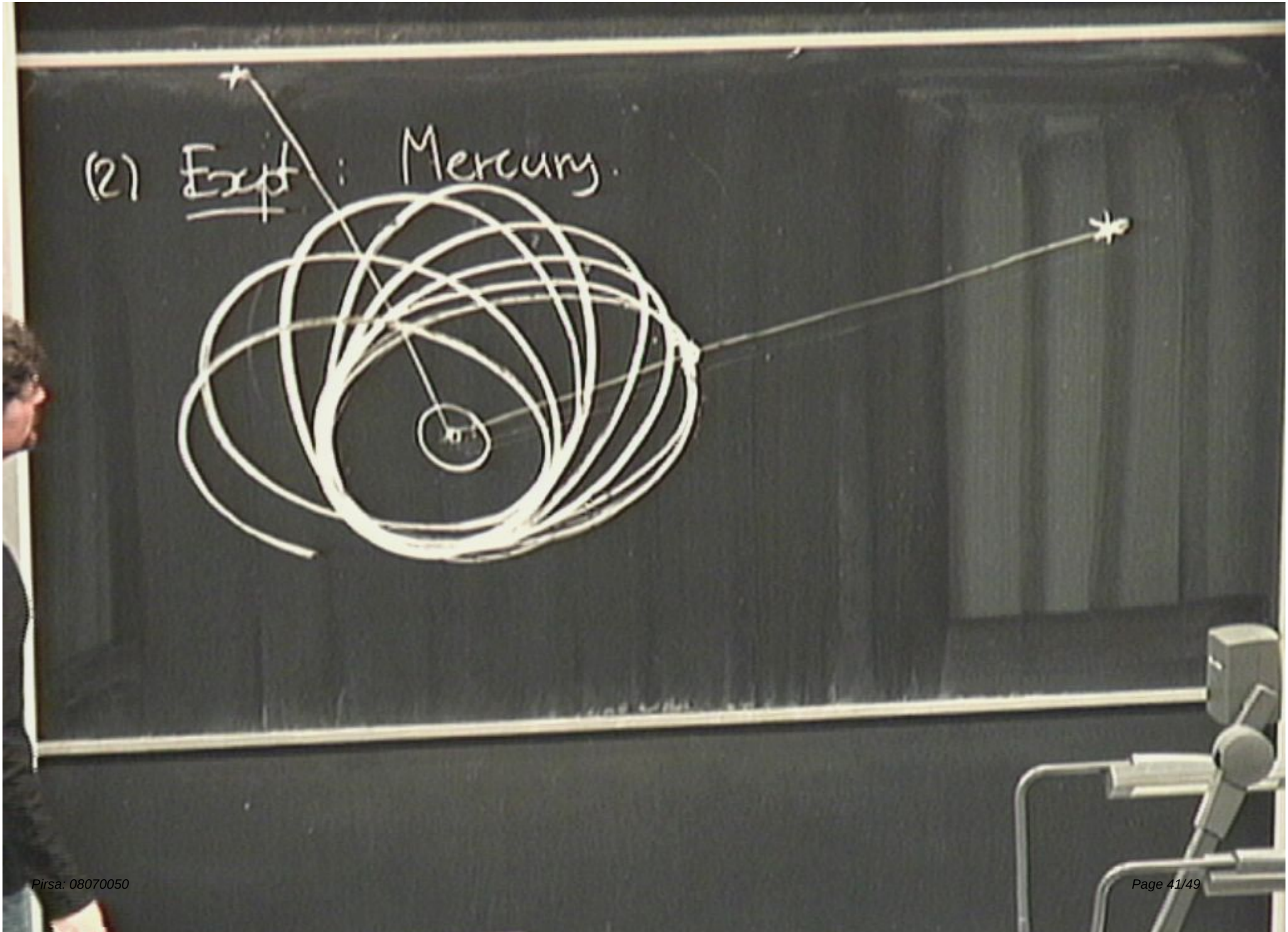
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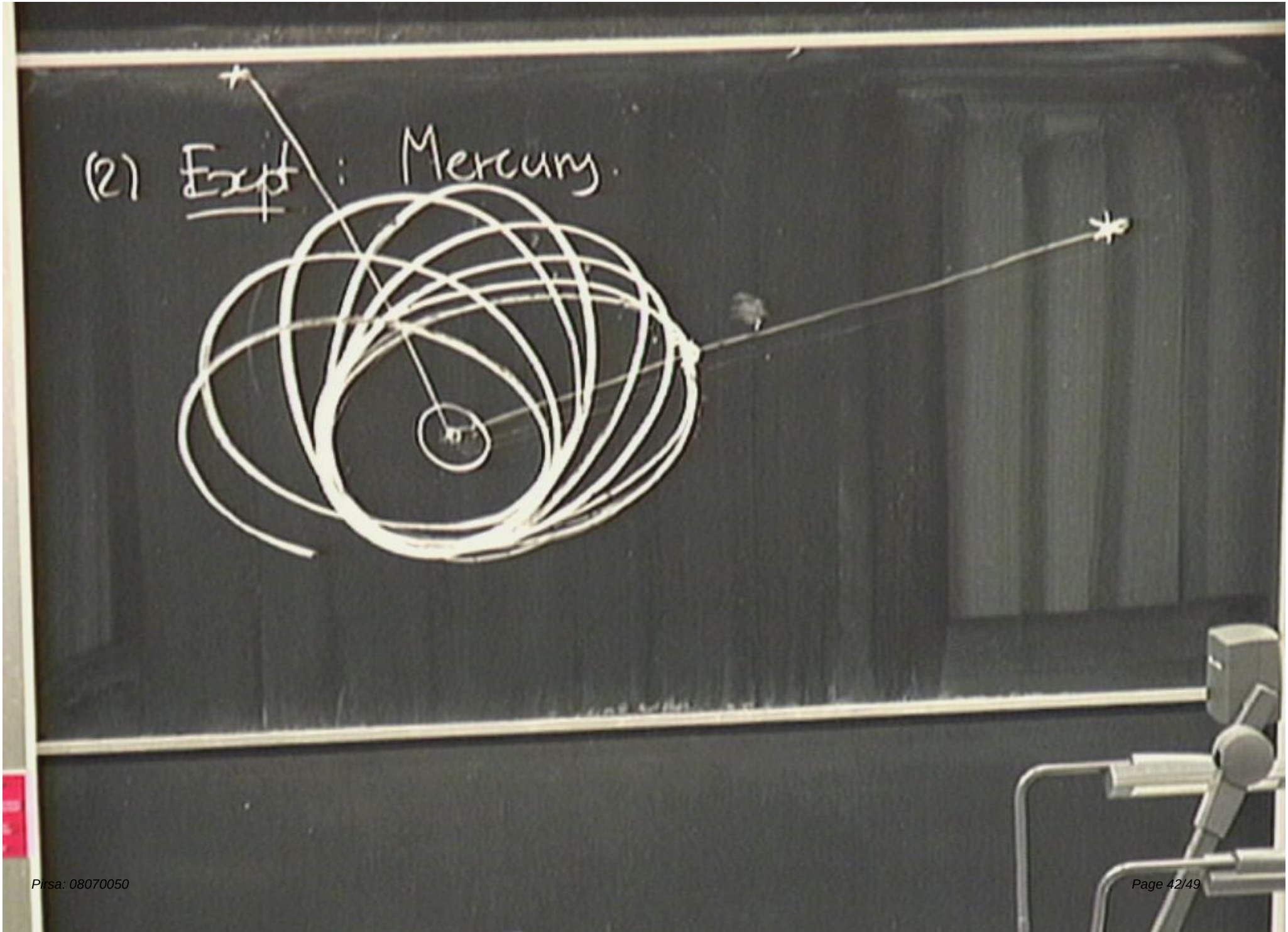
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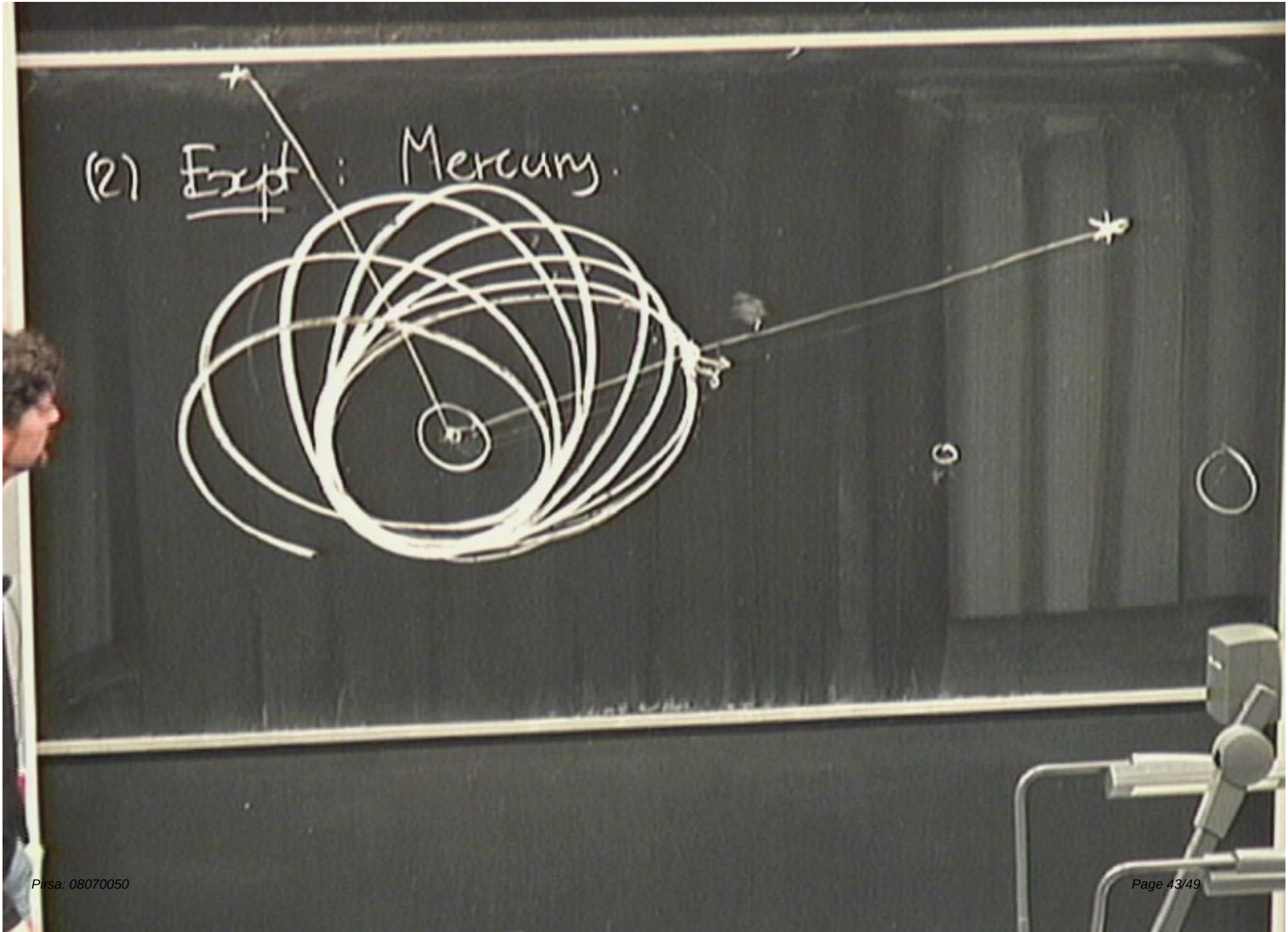
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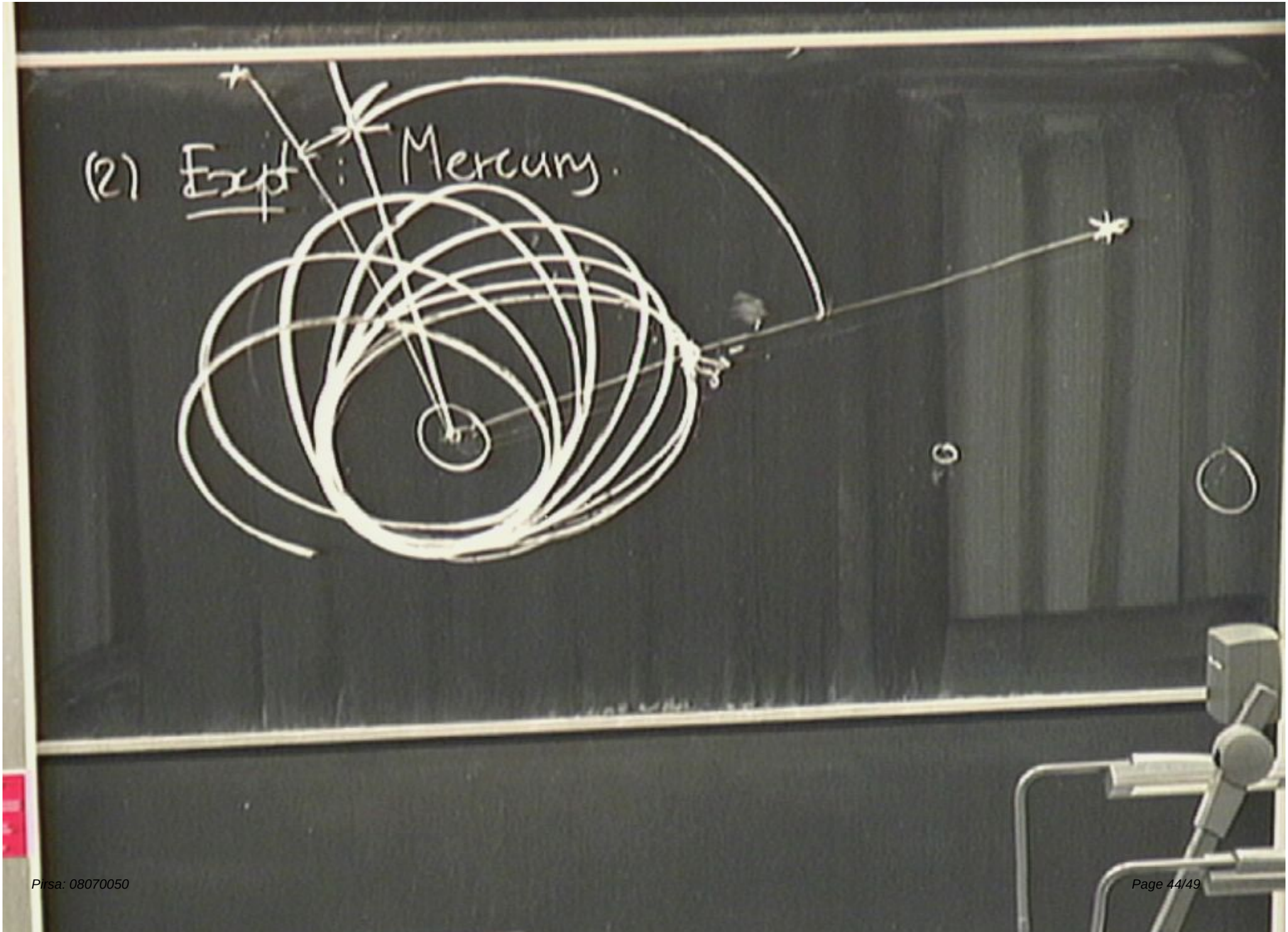
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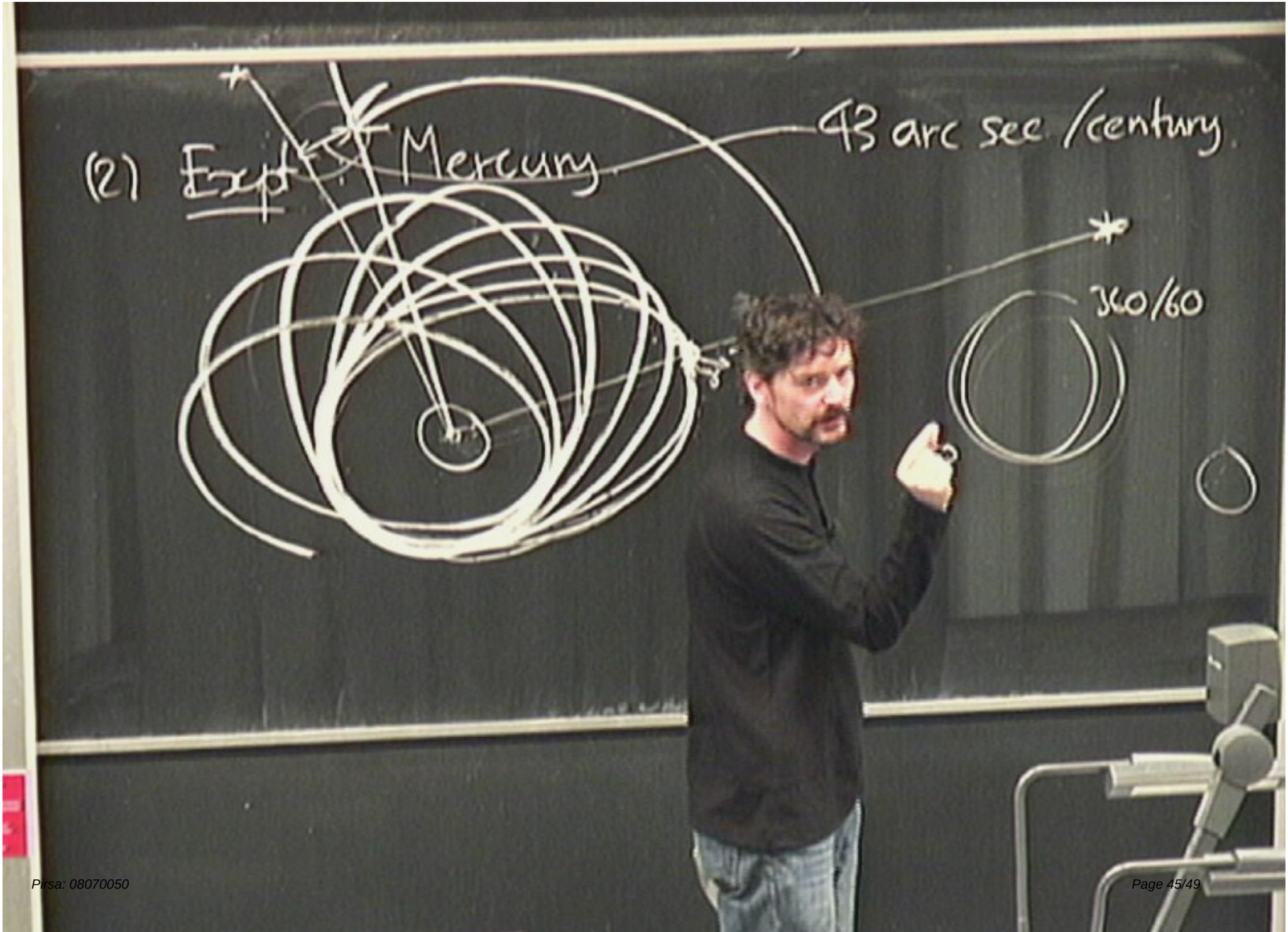
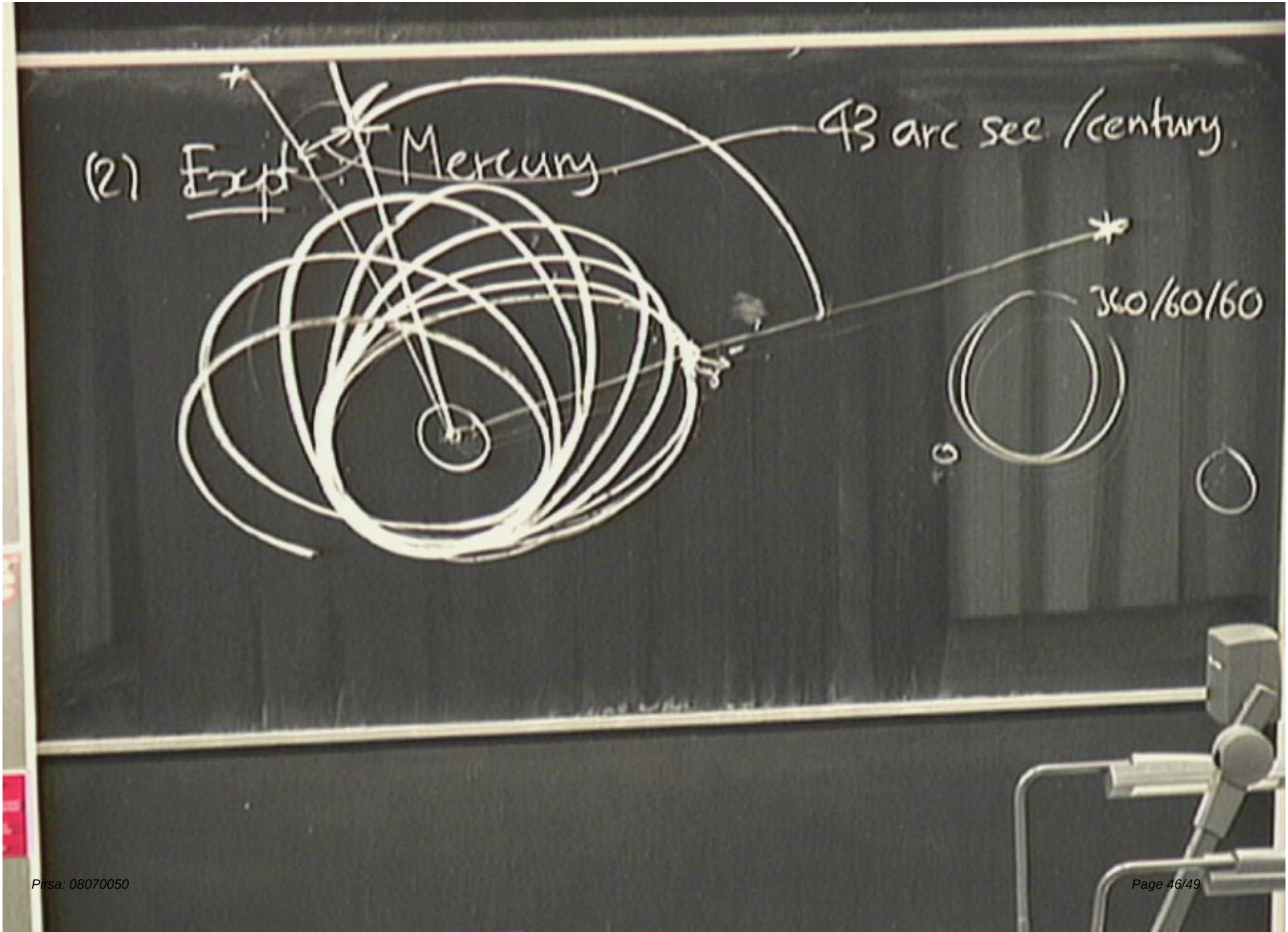

(2) Exp't: Mercury
43 arc sec /century
360/60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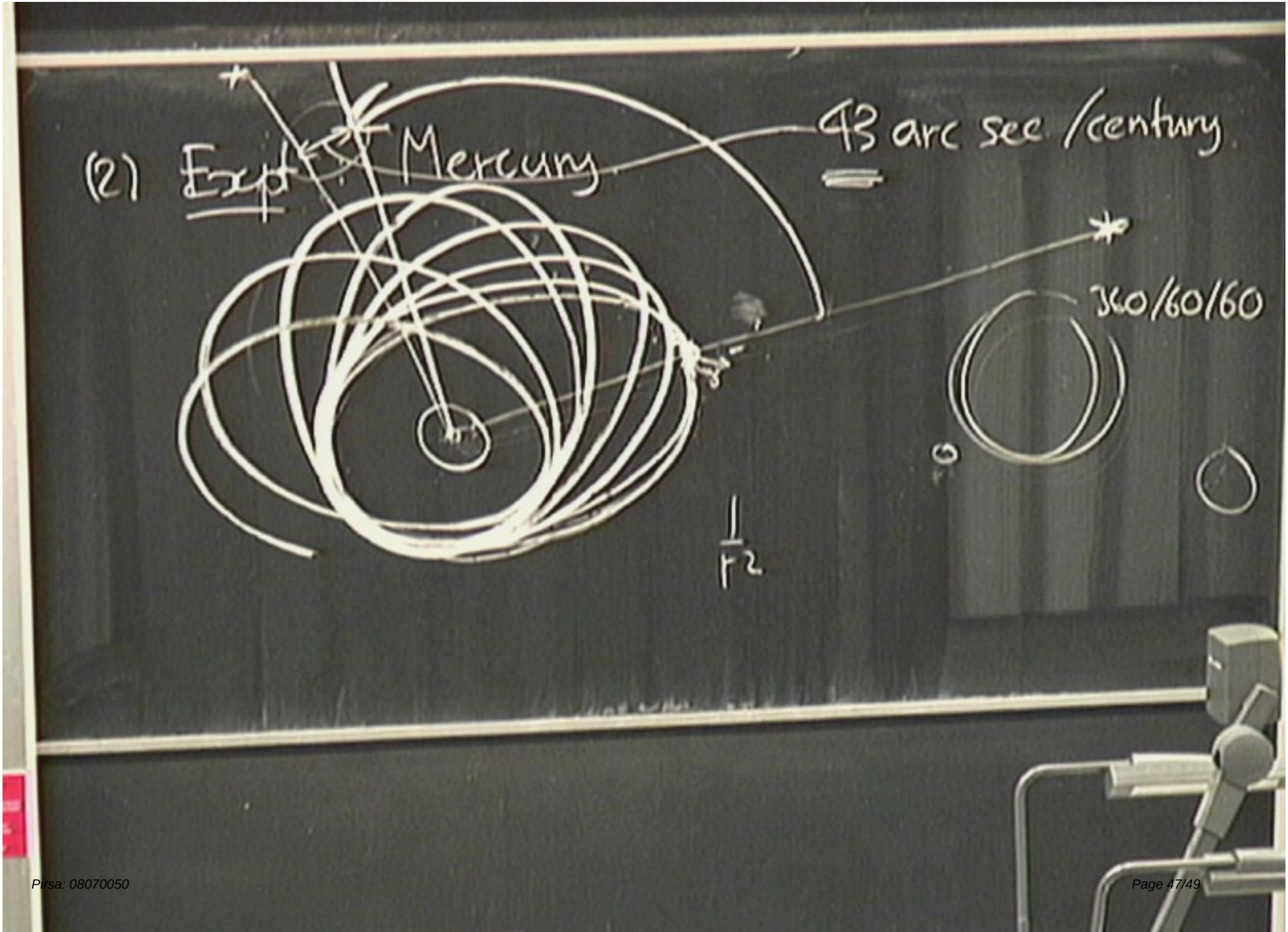
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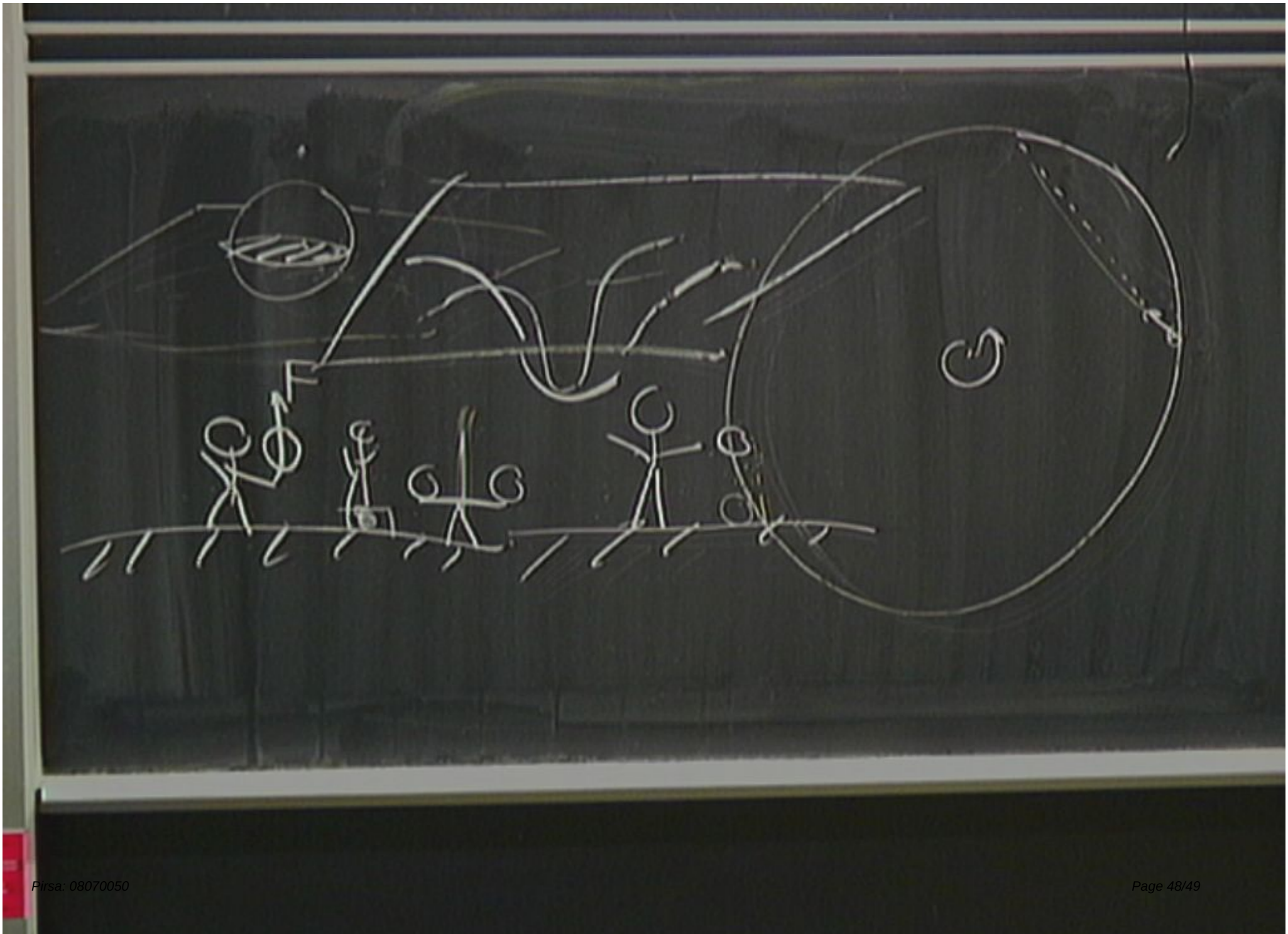
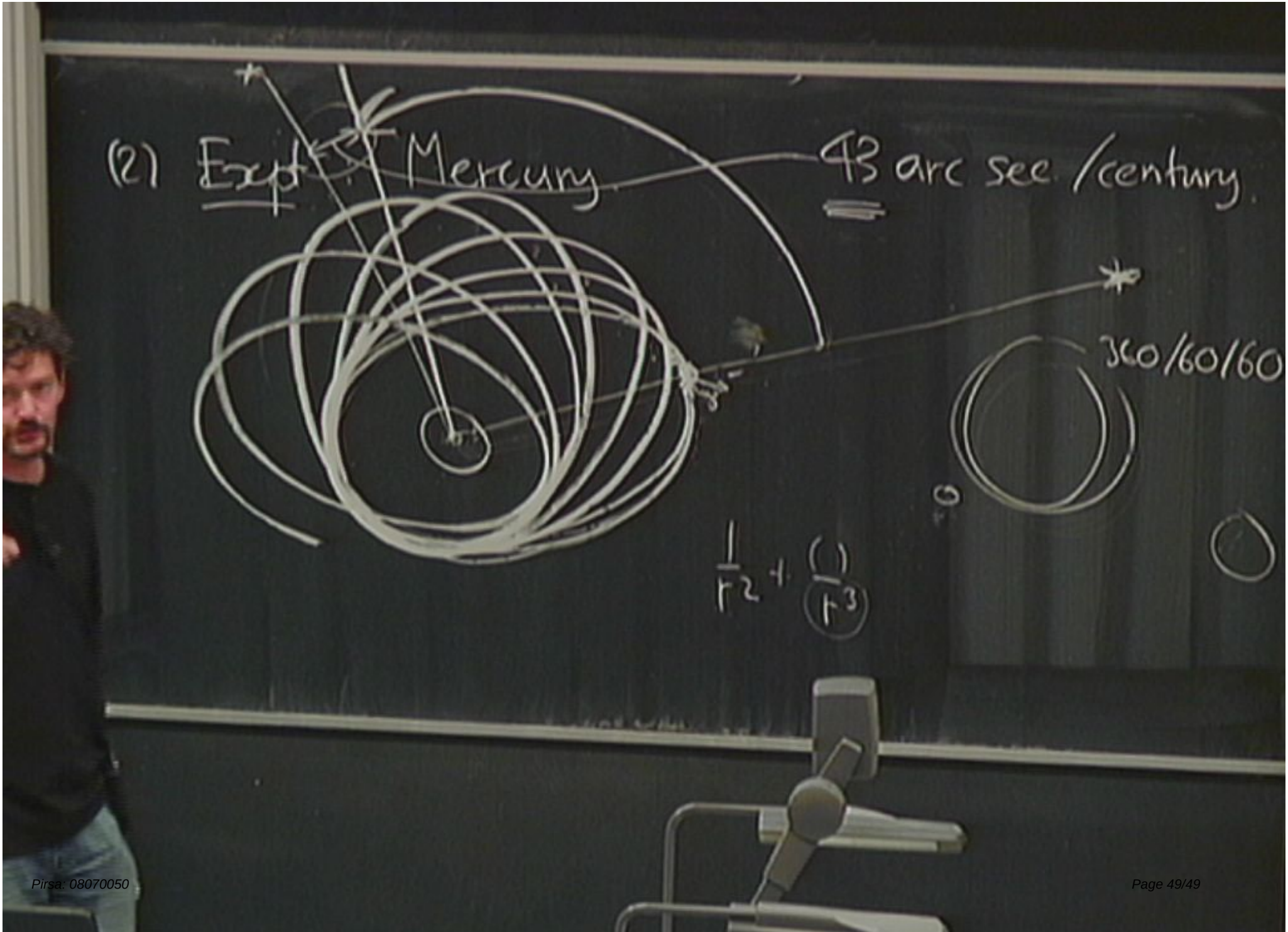
$\frac{1}{r^2}$

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$\frac{1}{r^2} + \frac{()}{r^3}$