

Title: Free Discussion

Date: Jun 16, 2014 05:00 PM

URL: <http://pirsa.org/14060013>

Abstract:

$$\alpha(t) = \alpha_0 + \Delta\alpha \sin(\Omega t)$$

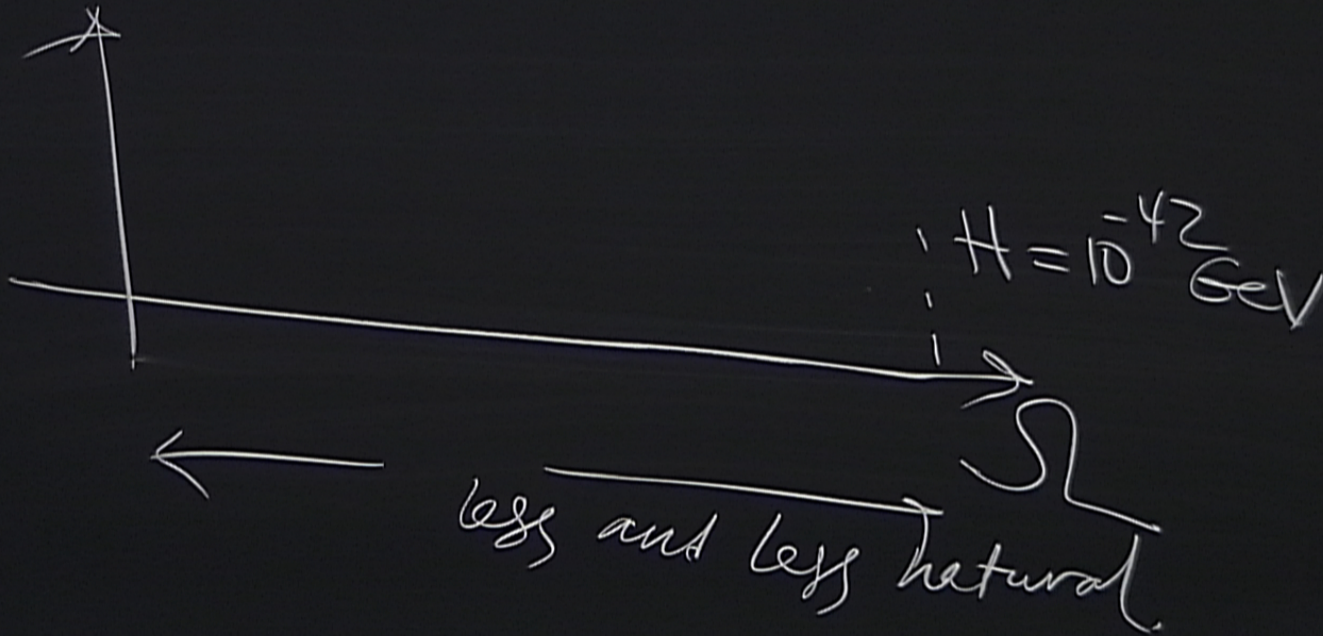


$$H = 10^{-42} \text{ GeV}$$

$\Omega$



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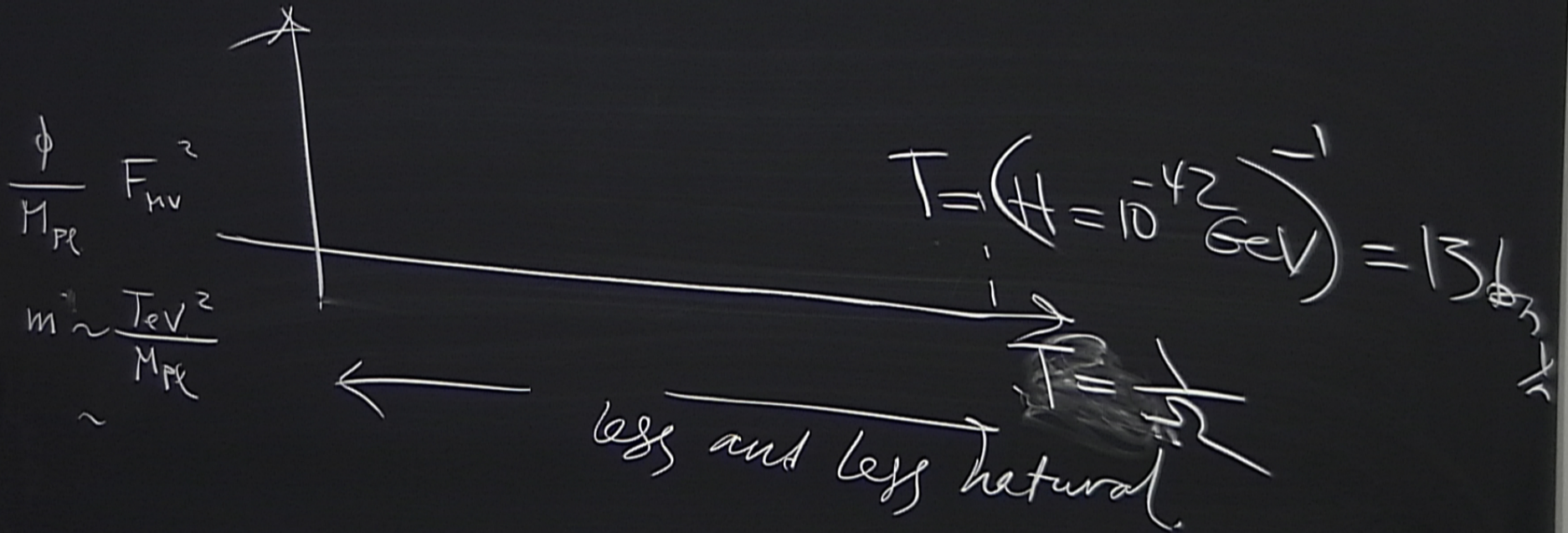


$$T = \left( H = 10^{-42} \frac{1}{\text{GeV}} \right)^{-1} = 13 \text{ billion years}$$

less and less natural



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$$\frac{\phi}{M_{Pl}} \quad F_{UV}^2$$

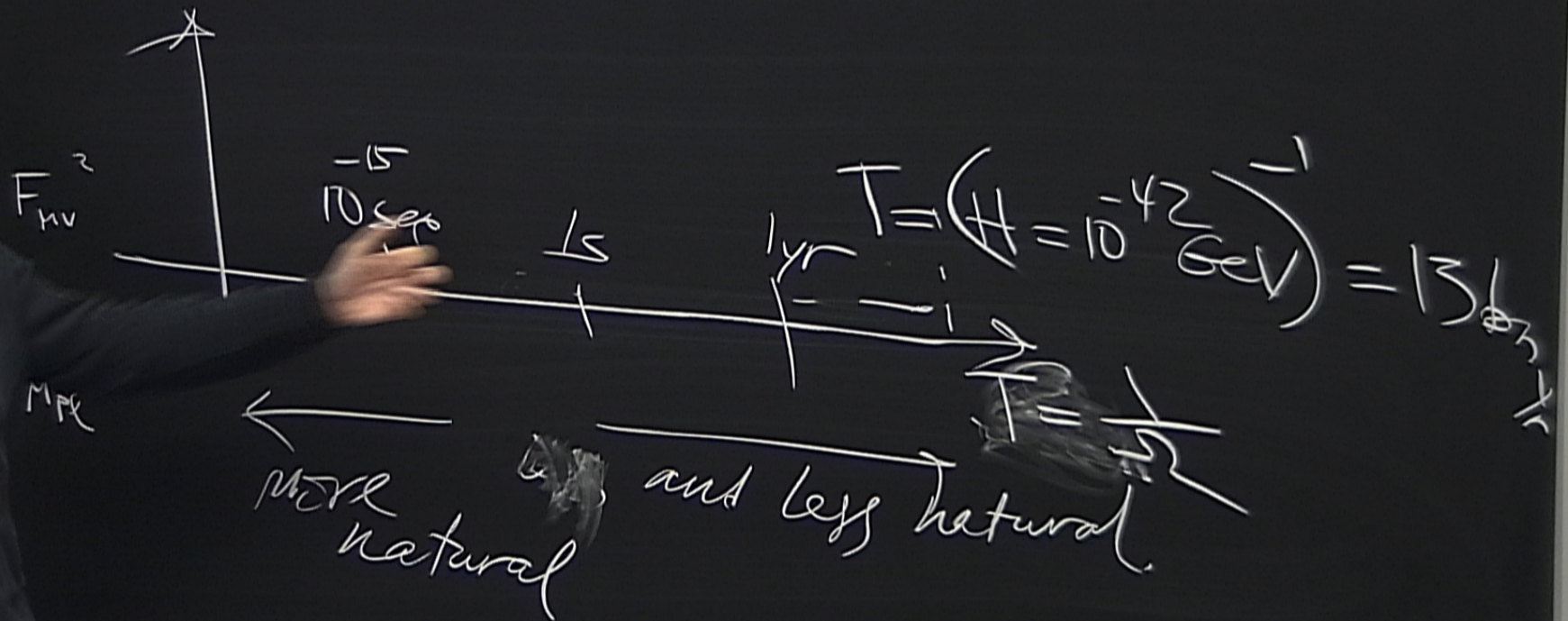
$$m \sim \frac{\text{TeV}^2}{M_{Pl}}$$

$$T = \left( H = 10^{-42} \frac{1}{\text{GeV}} \right)^{-1} = 13 \text{ billion years}$$

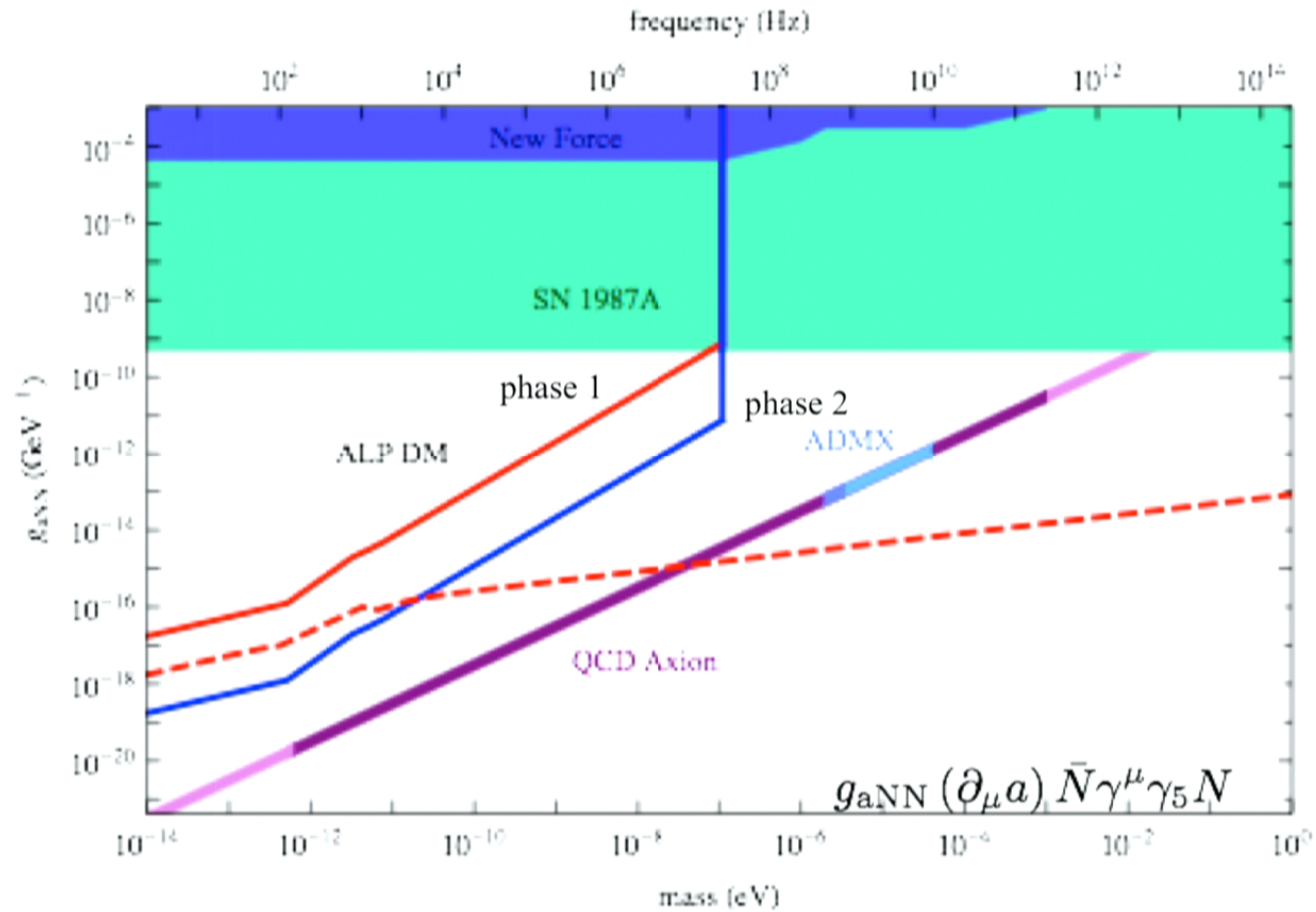
is less natural



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# Limits on Axion-Nucleon Coupling



~ year to scan one decade of frequency



# GNOME & CASPEr Open Qns

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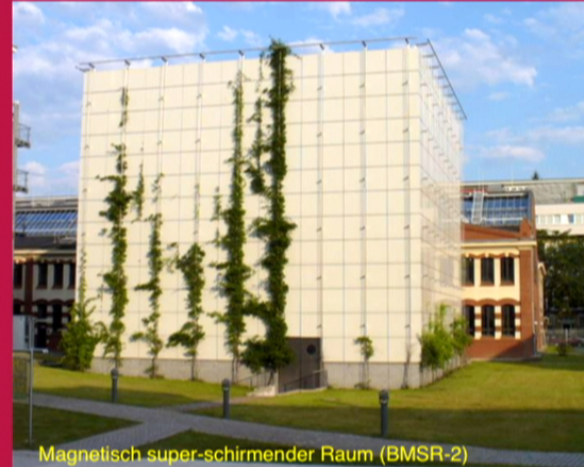
- ▣ Axion “g” factors for  $^{129}\text{Xe}$ ,  $^3\text{He}$ ,  $^{87}\text{Rb}$ , ...



# CASPEr now!



Prof. Dr. Lutz Trahms



Magnetisch super-schirmender Raum (BMSR-2)

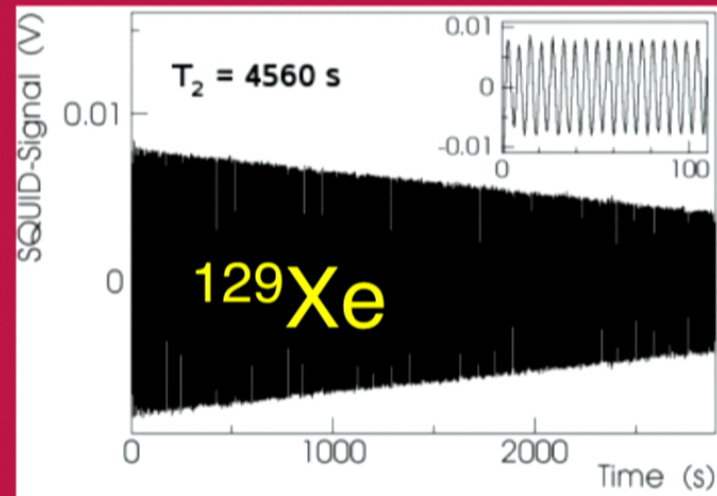
# CASPEr now!



29



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29

# GNOME & CASPEr Open Qns

- ▣ Axion “g” factors for  $^{129}\text{Xe}$ ,  $^3\text{He}$ ,  $^{87}\text{Rb}$ , ...
- ▣ Optimal experimental strategy for “GNOME now”

7

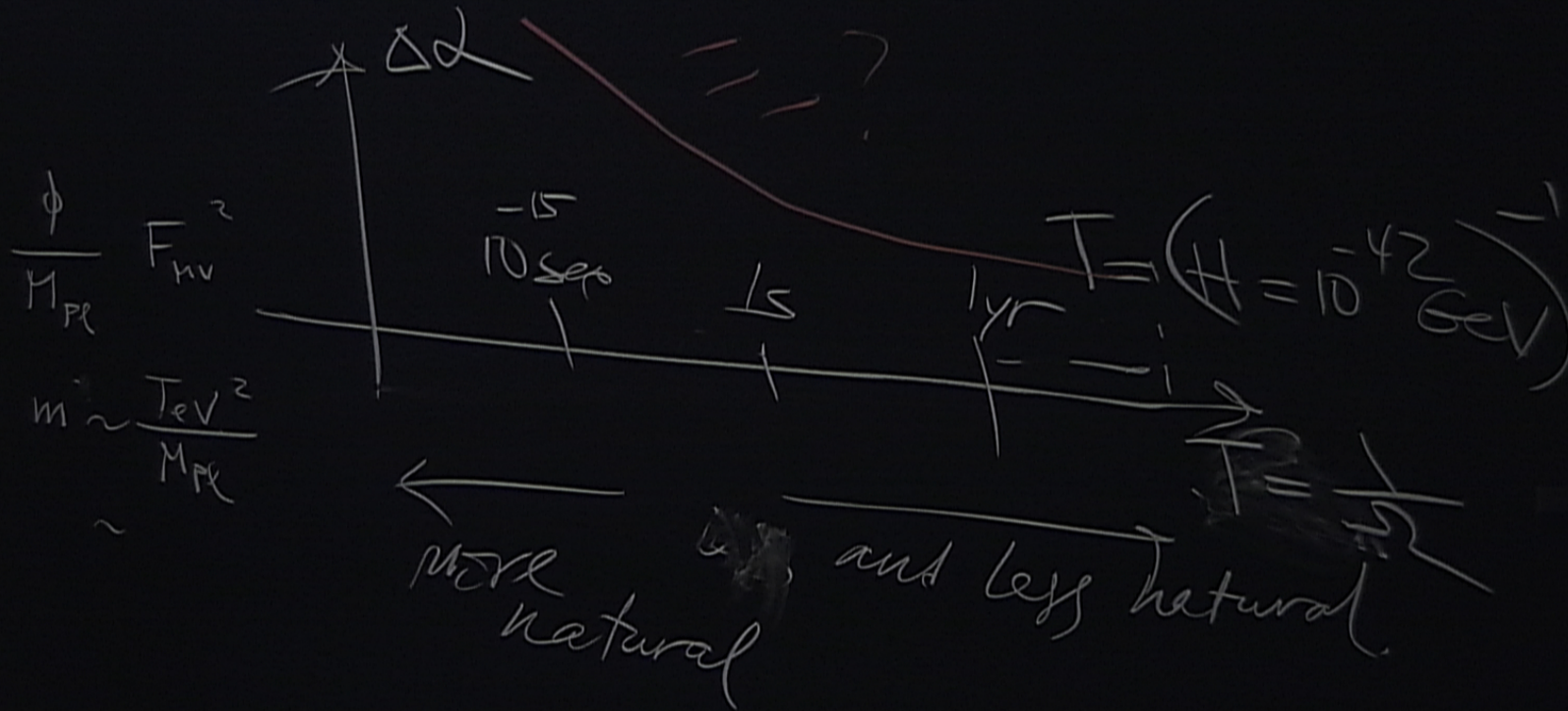


# GNOME & CASPEr Open Qns

- ▣ Axion “g” factors for  $^{129}\text{Xe}$ ,  $^3\text{He}$ ,  $^{87}\text{Rb}$ , ...
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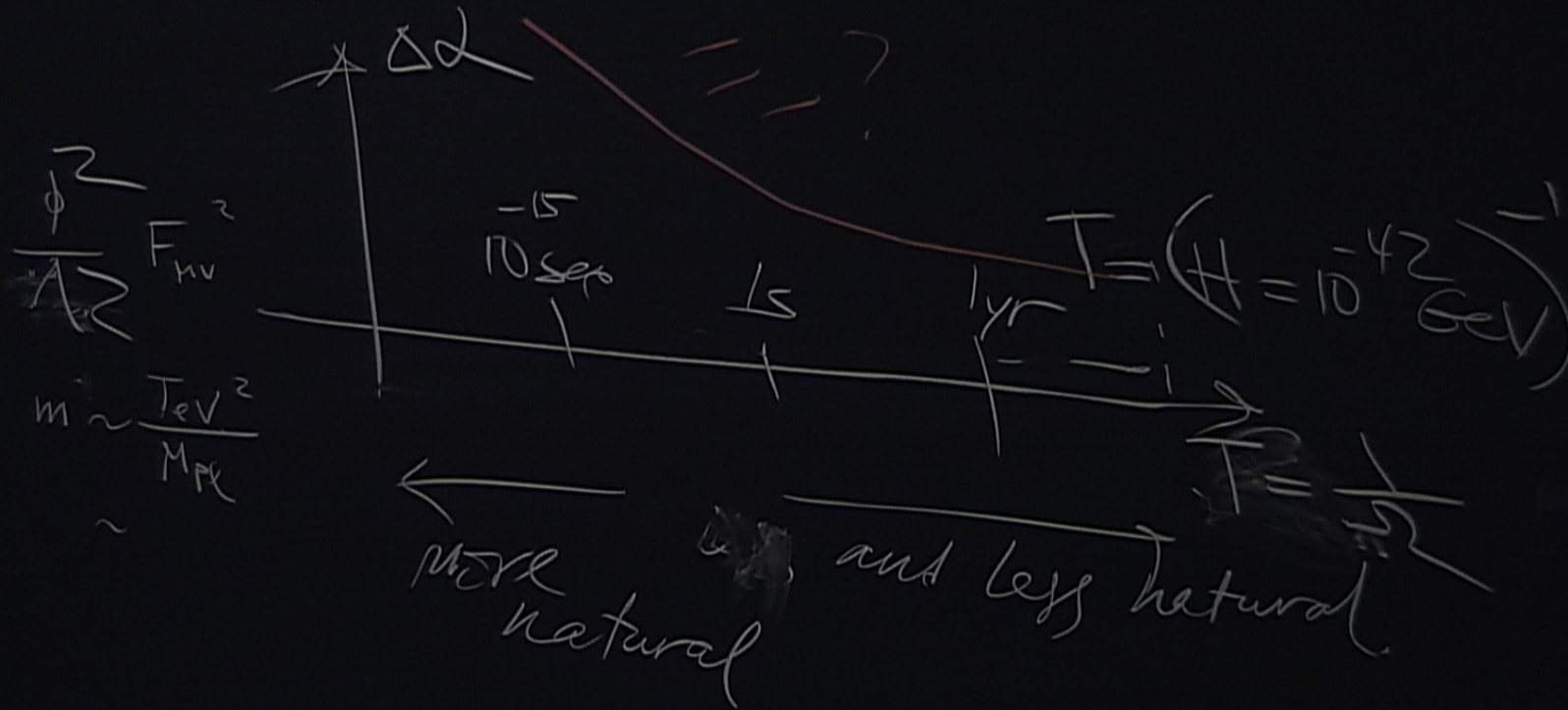
7

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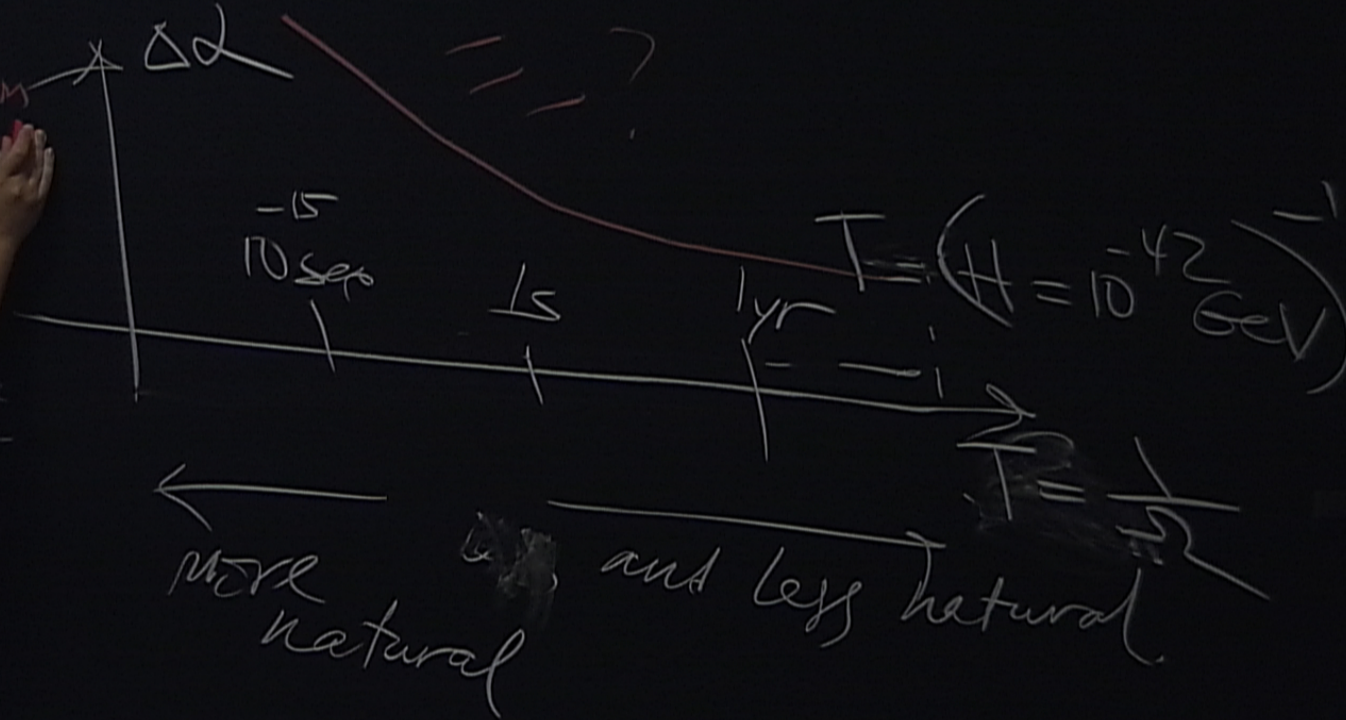




$$\alpha(t) = \alpha_0 + \Delta\alpha \sin(\Omega t)$$

$$m^2 \phi^2 = \rho_{DM} \Delta\alpha$$

$$\frac{\phi^2}{M_{Pl}^2} \sim \frac{F_{DM}}{M_{Pl}^2}$$





# Francis M. Pipkin award

To honor exceptional research accomplishments by a young scientist in the interdisciplinary area of precision measurement and fundamental constants.

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Any APS member, not a member of the award Selection Committee, may submit a nominations.