

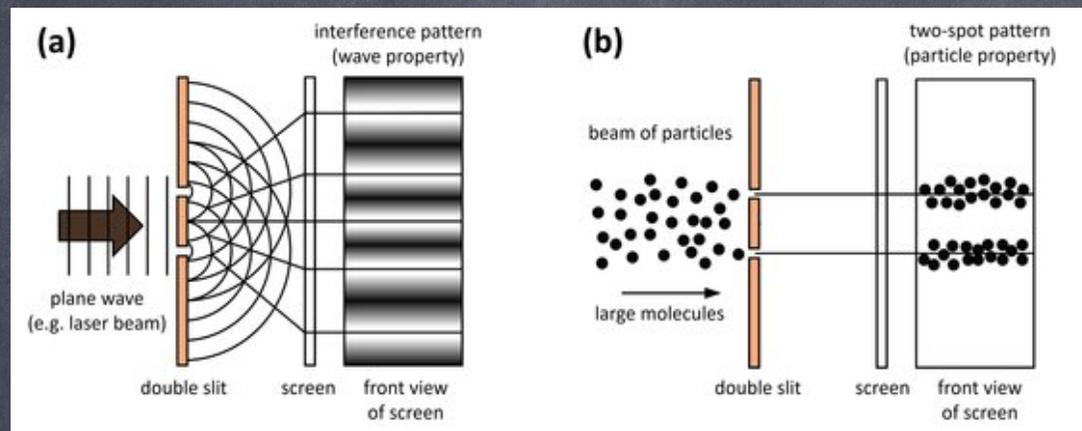
PHY 127 FS2025

Prof. Ben Kilminster

Lecture 4

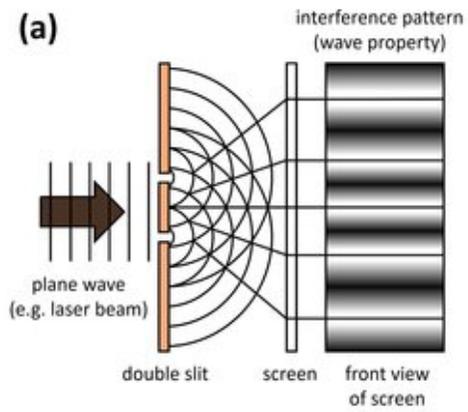
March 14th, 2024

Today, we explore the wave functions of particles and how this relates to their quantum probabilities.

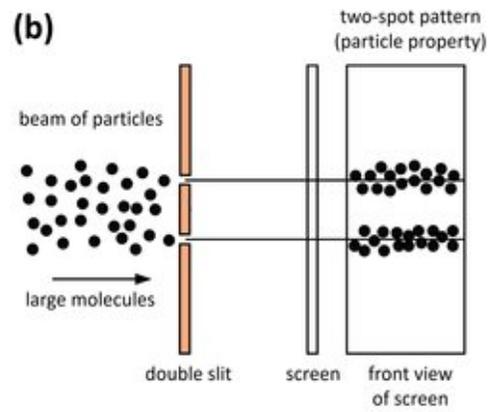


What do individual photon particles do ?

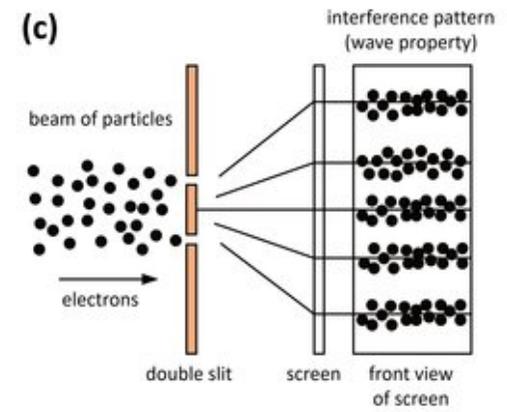
waves

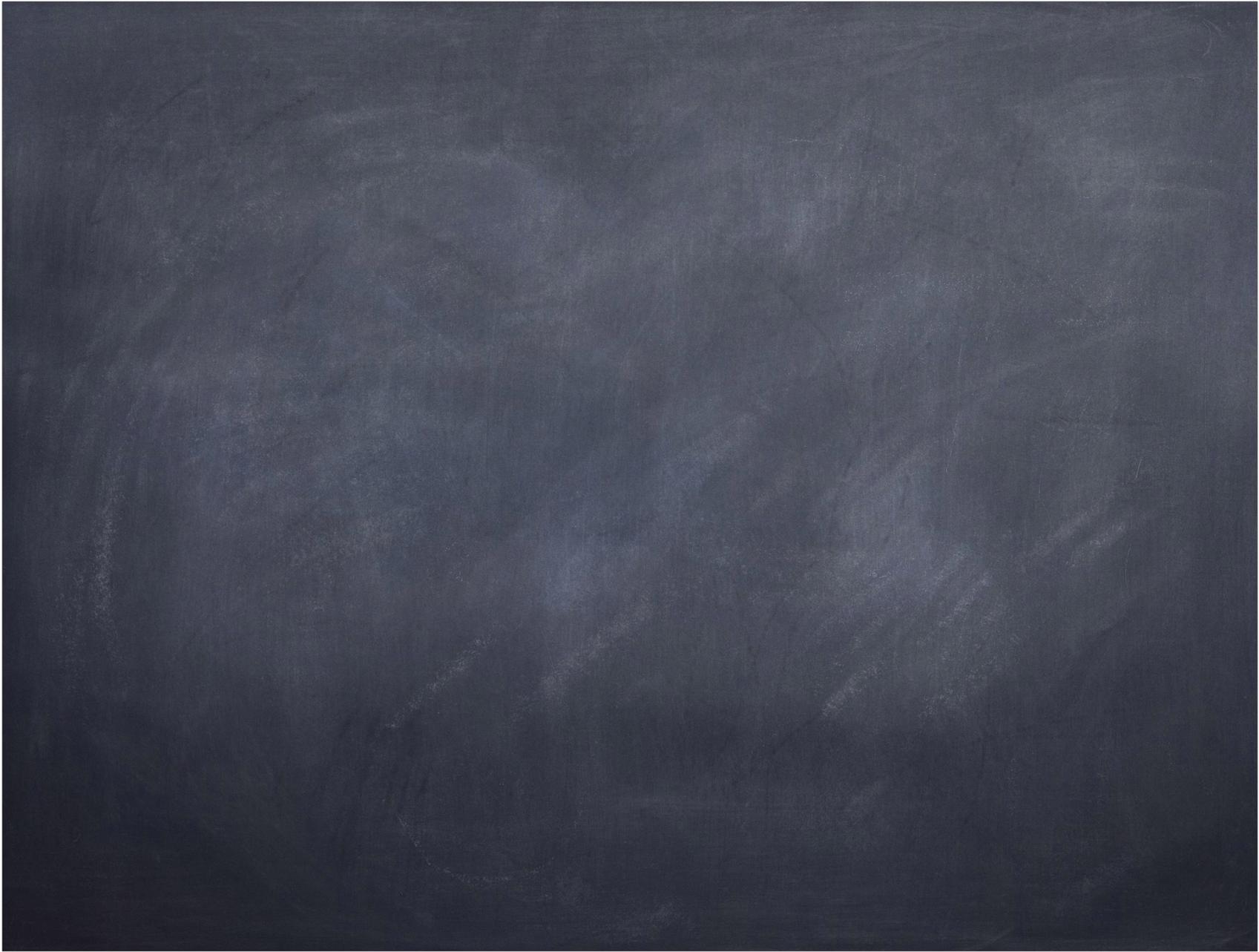


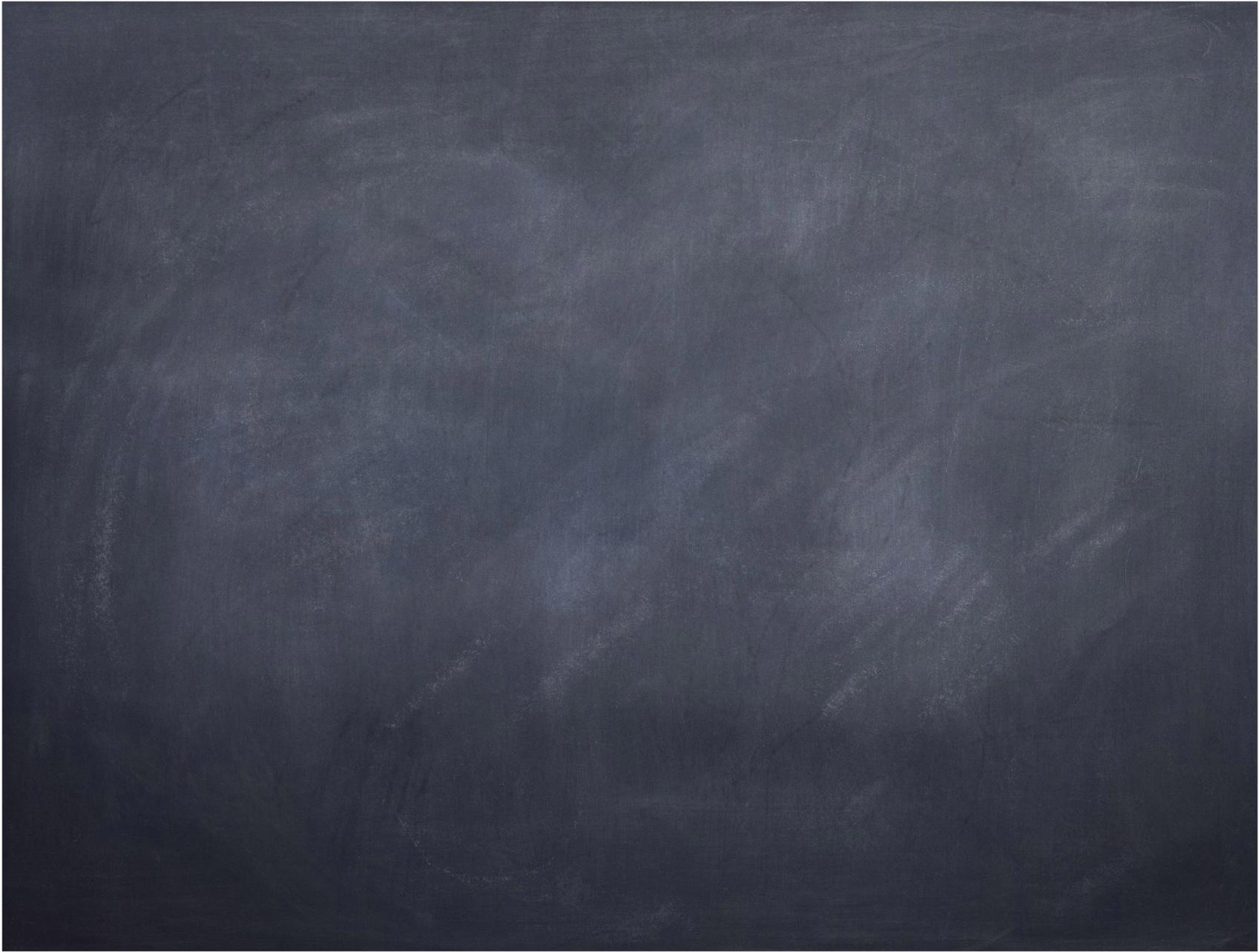
particles

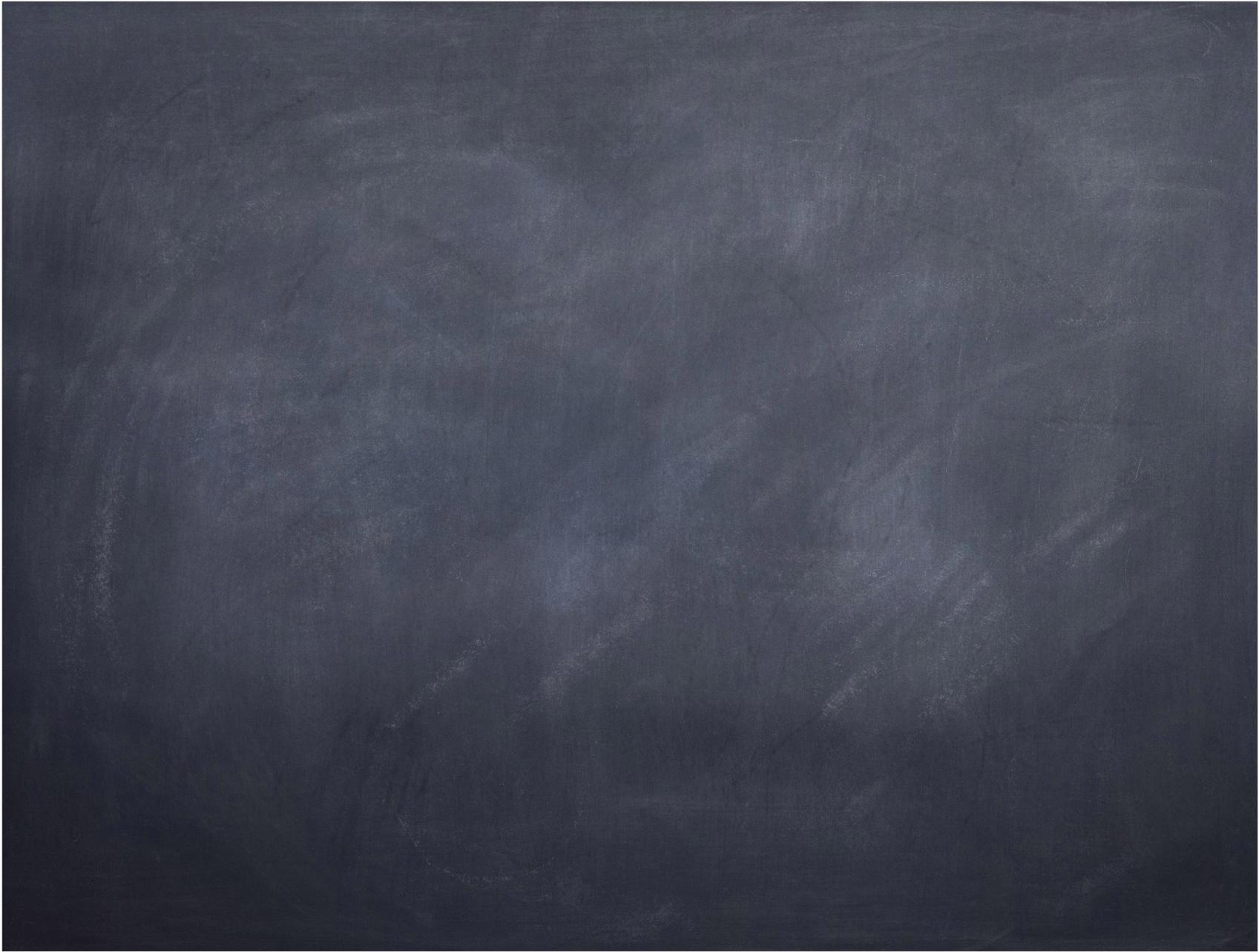


photons

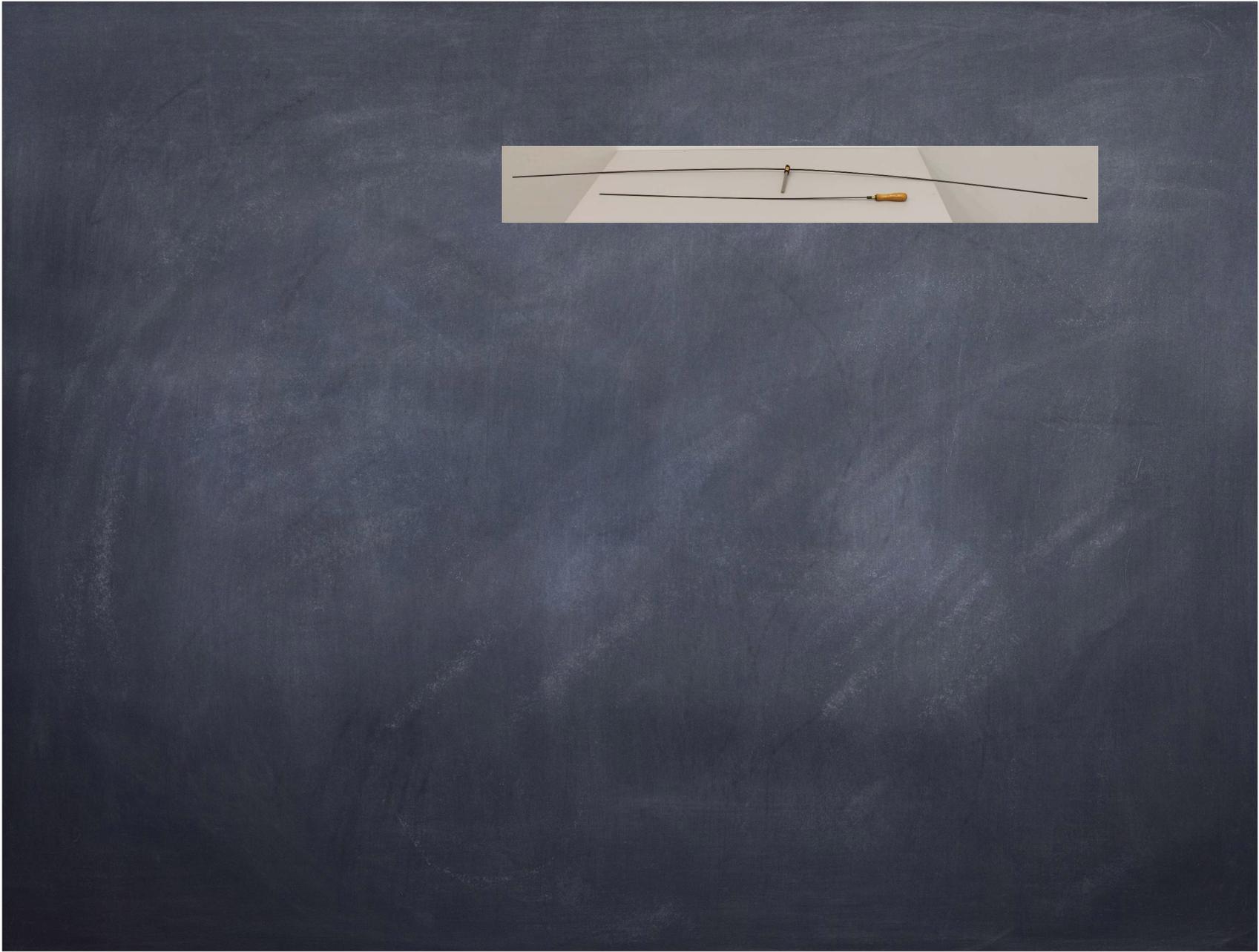


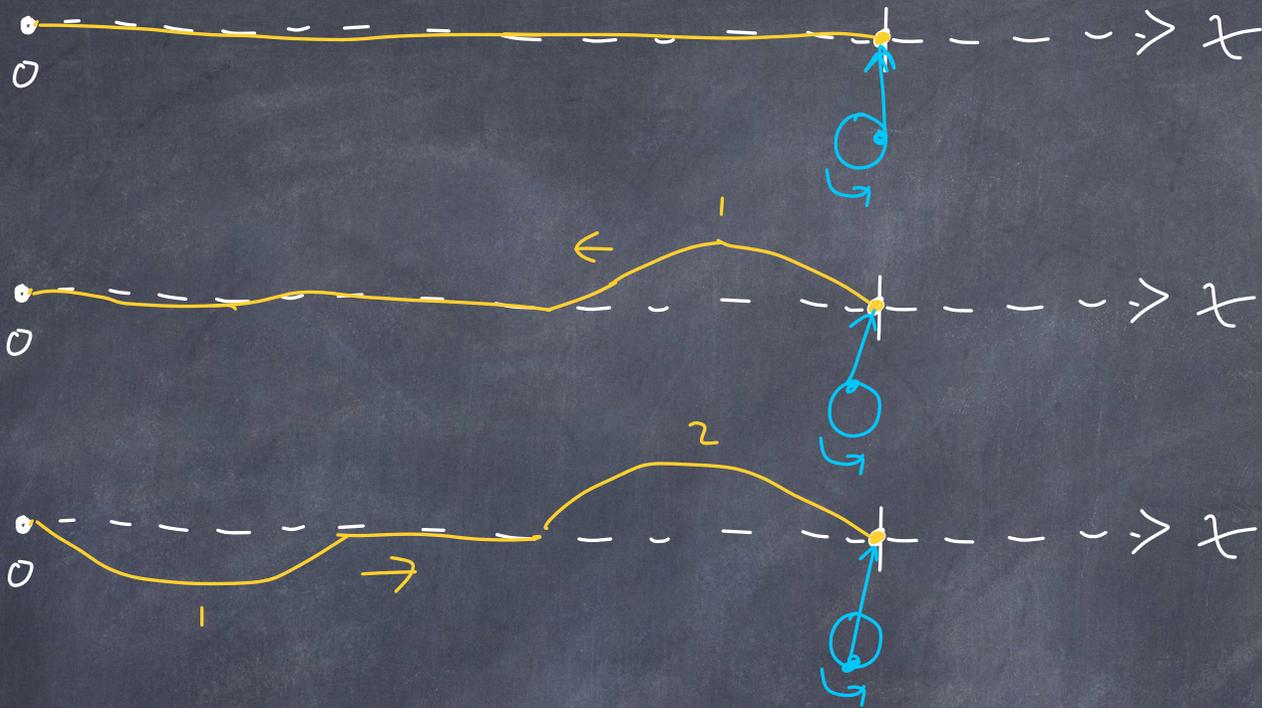




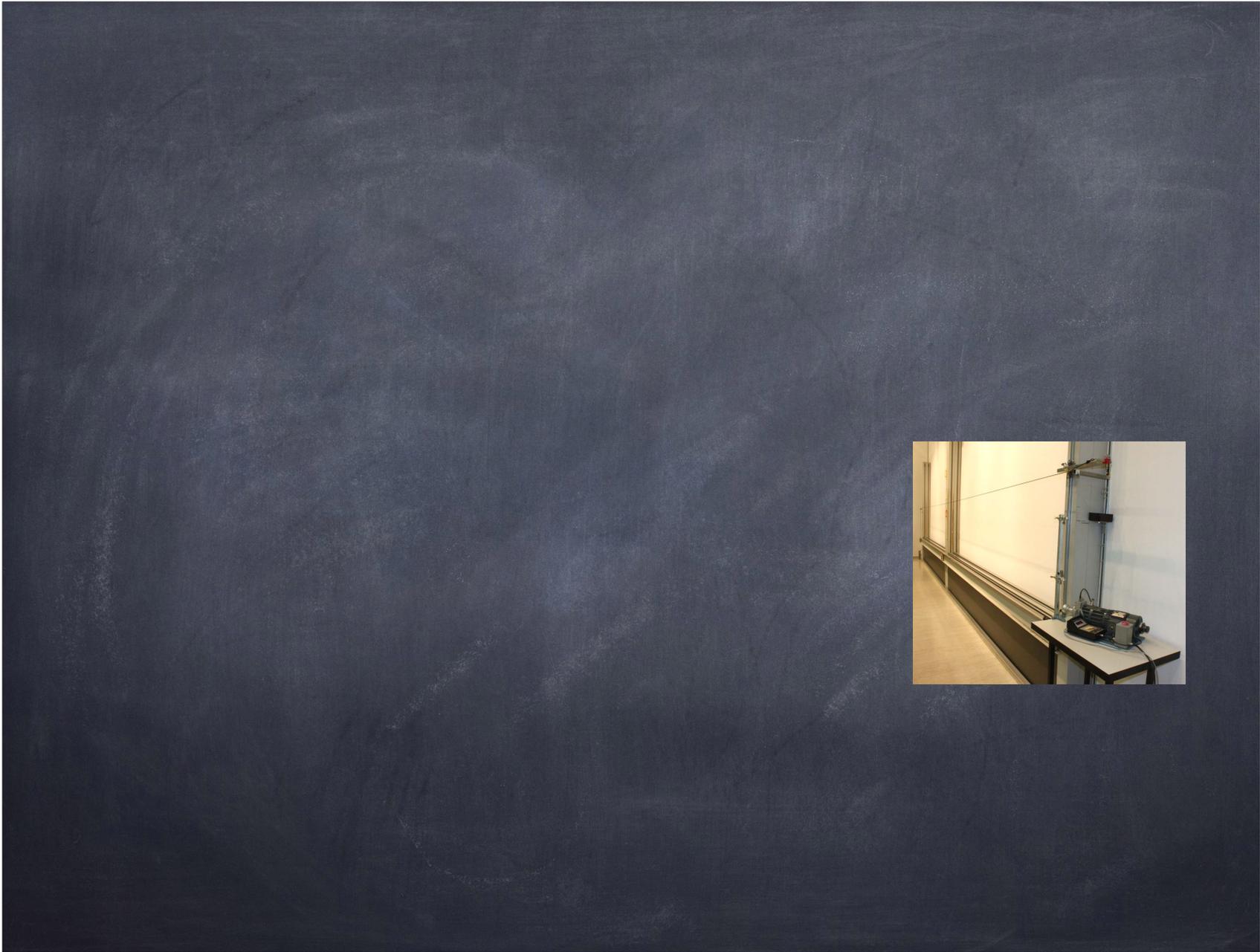










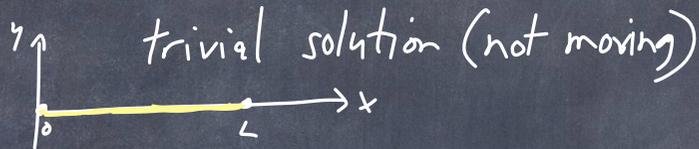


So standing waves at $t=0$ are of the form

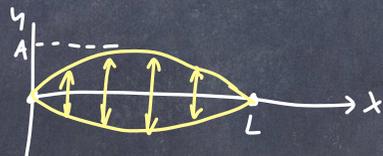
$$y(x) = A \sin\left(\frac{2\pi x}{\lambda}\right)$$

But which specific wavelengths are allowed?

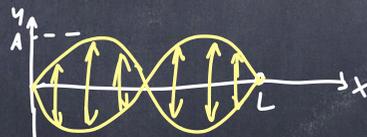
0 bumps



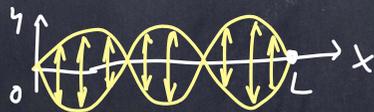
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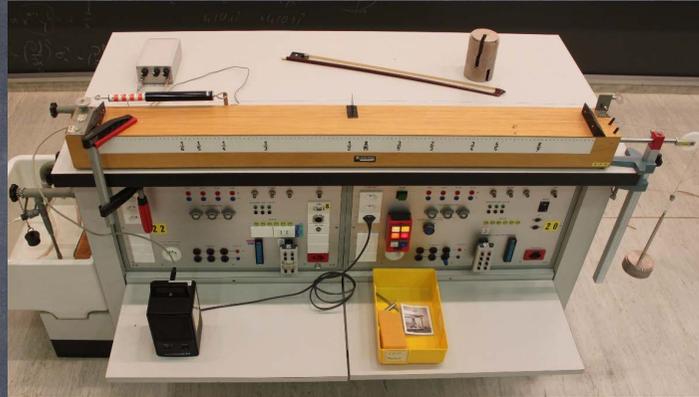


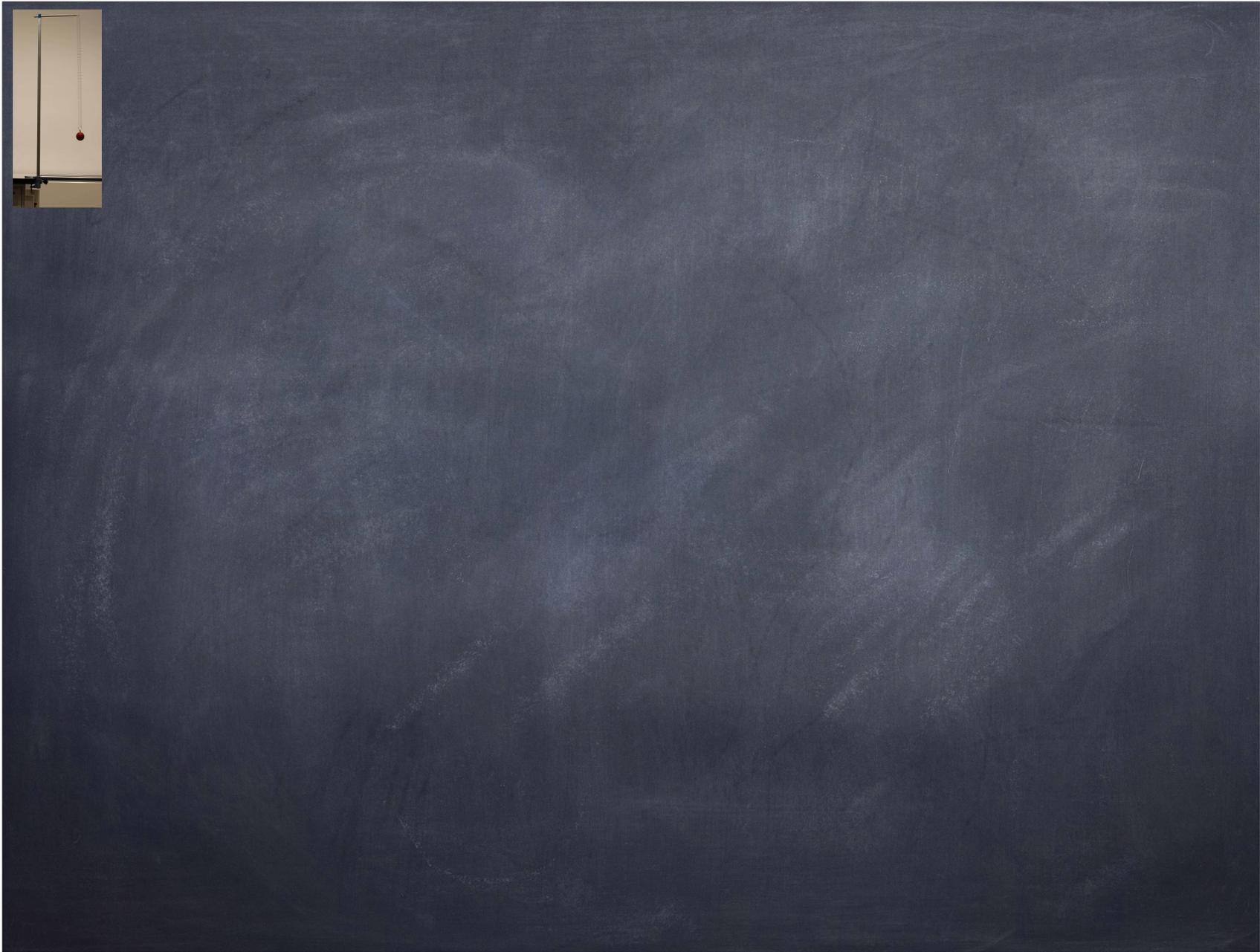
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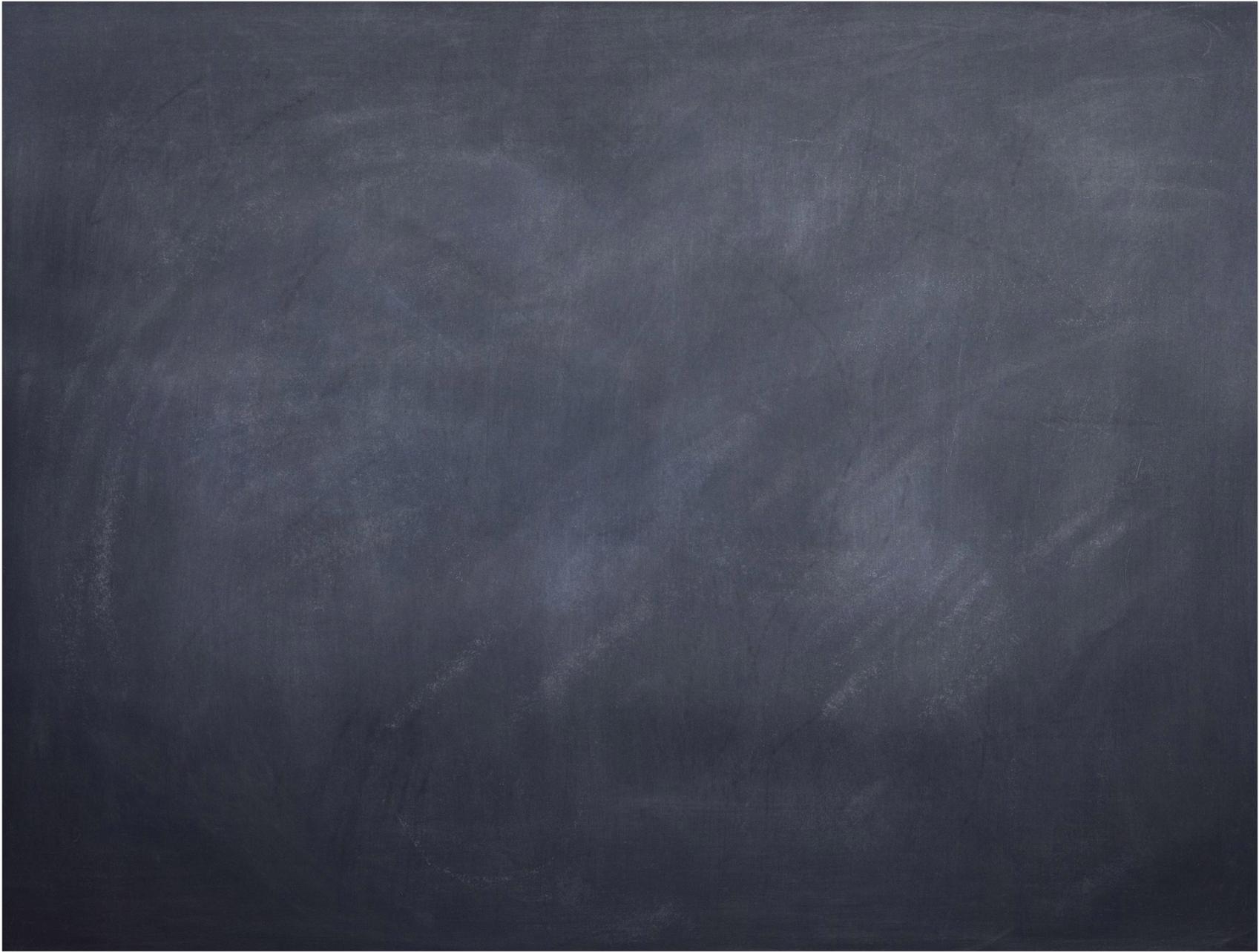


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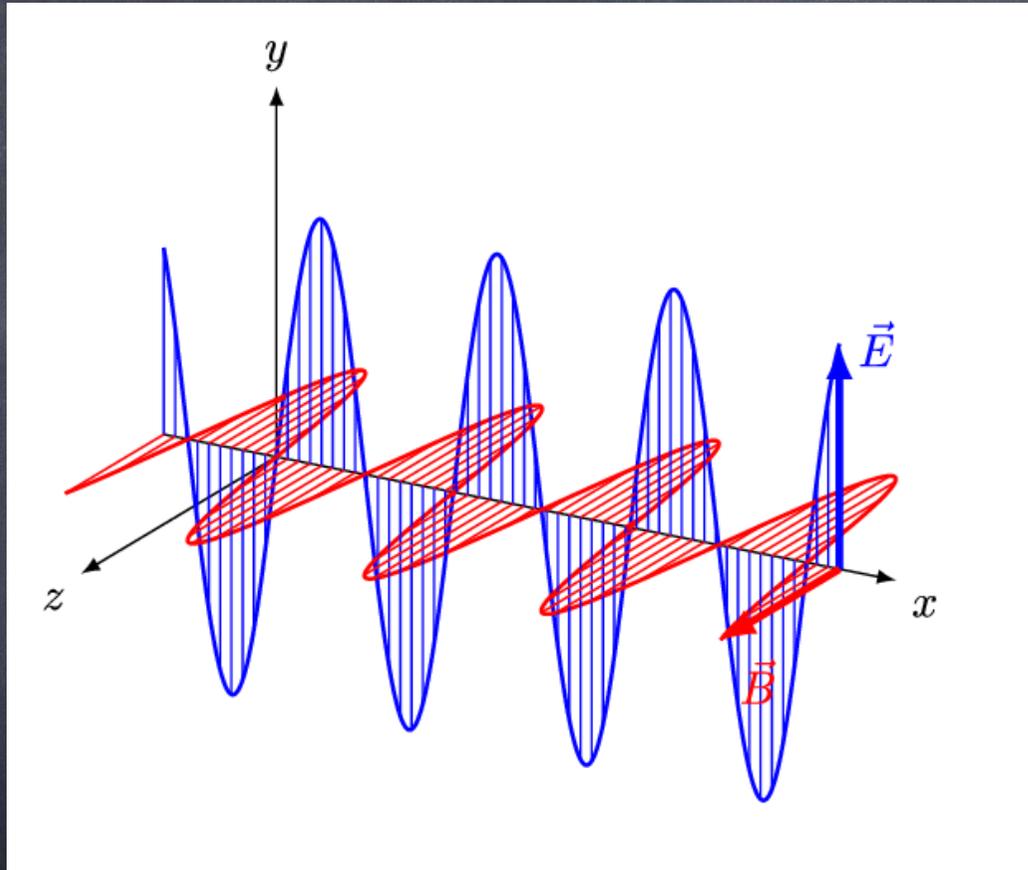




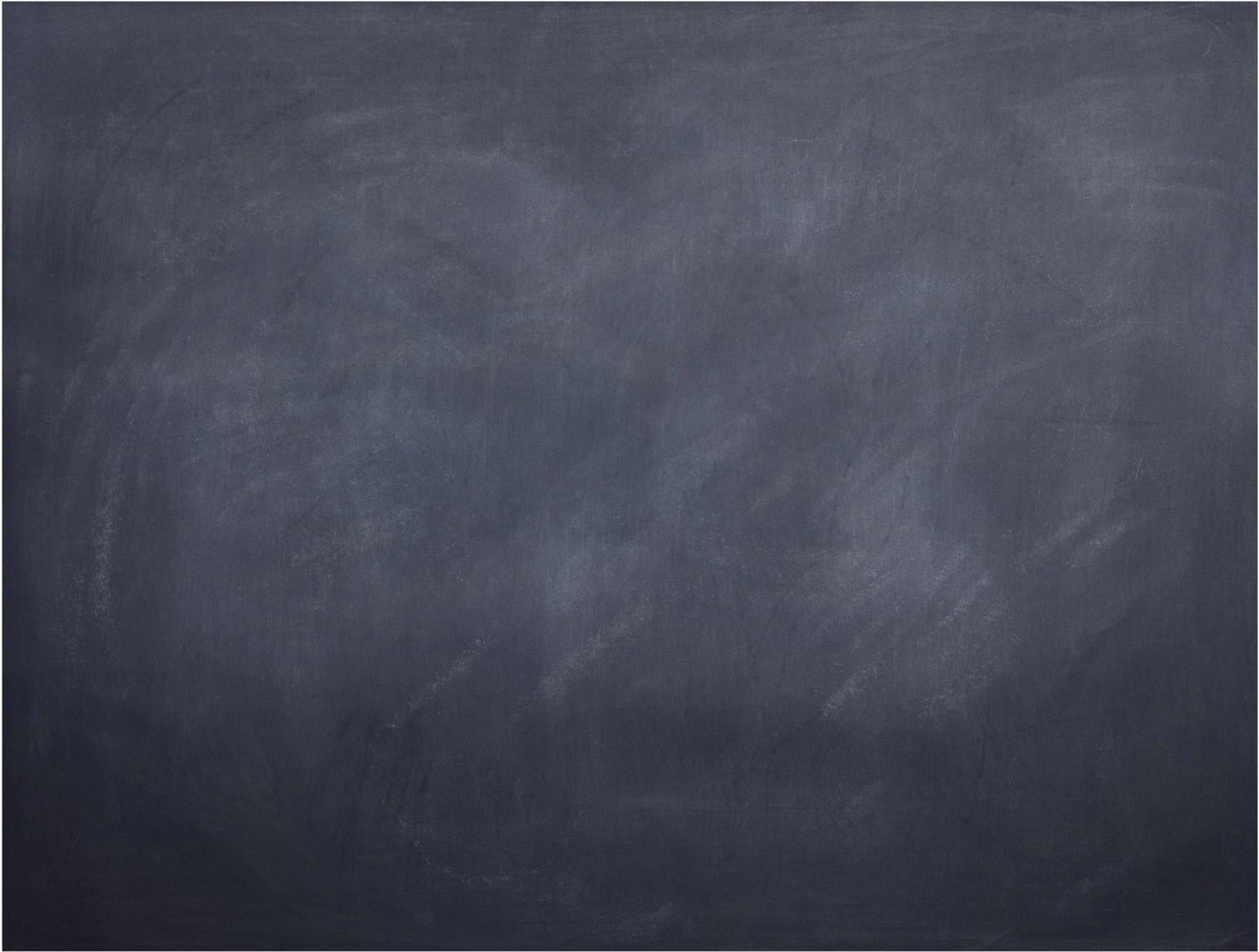


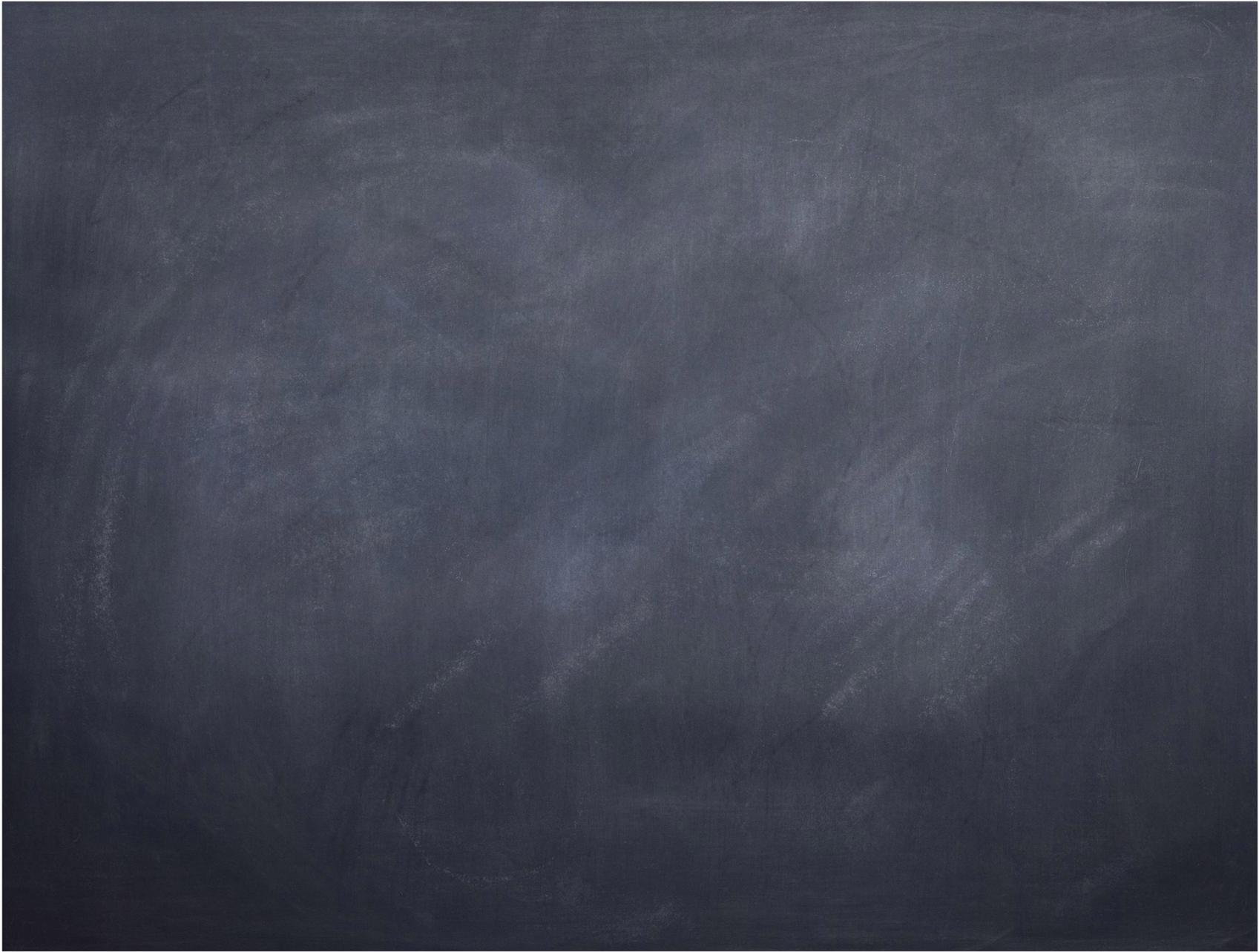


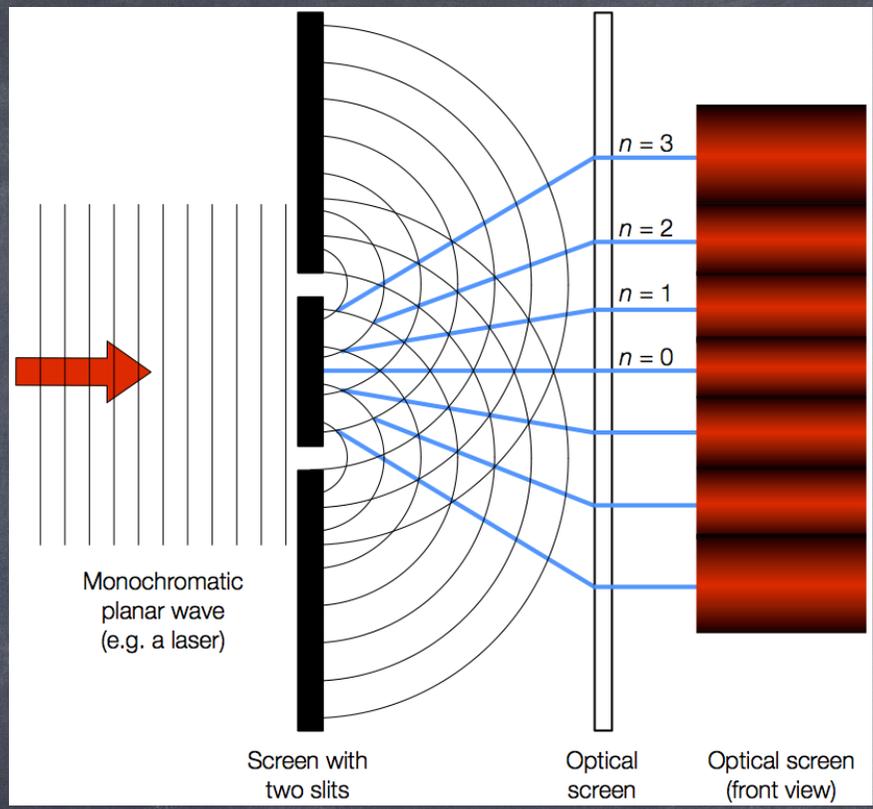
An electromagnetic wave :

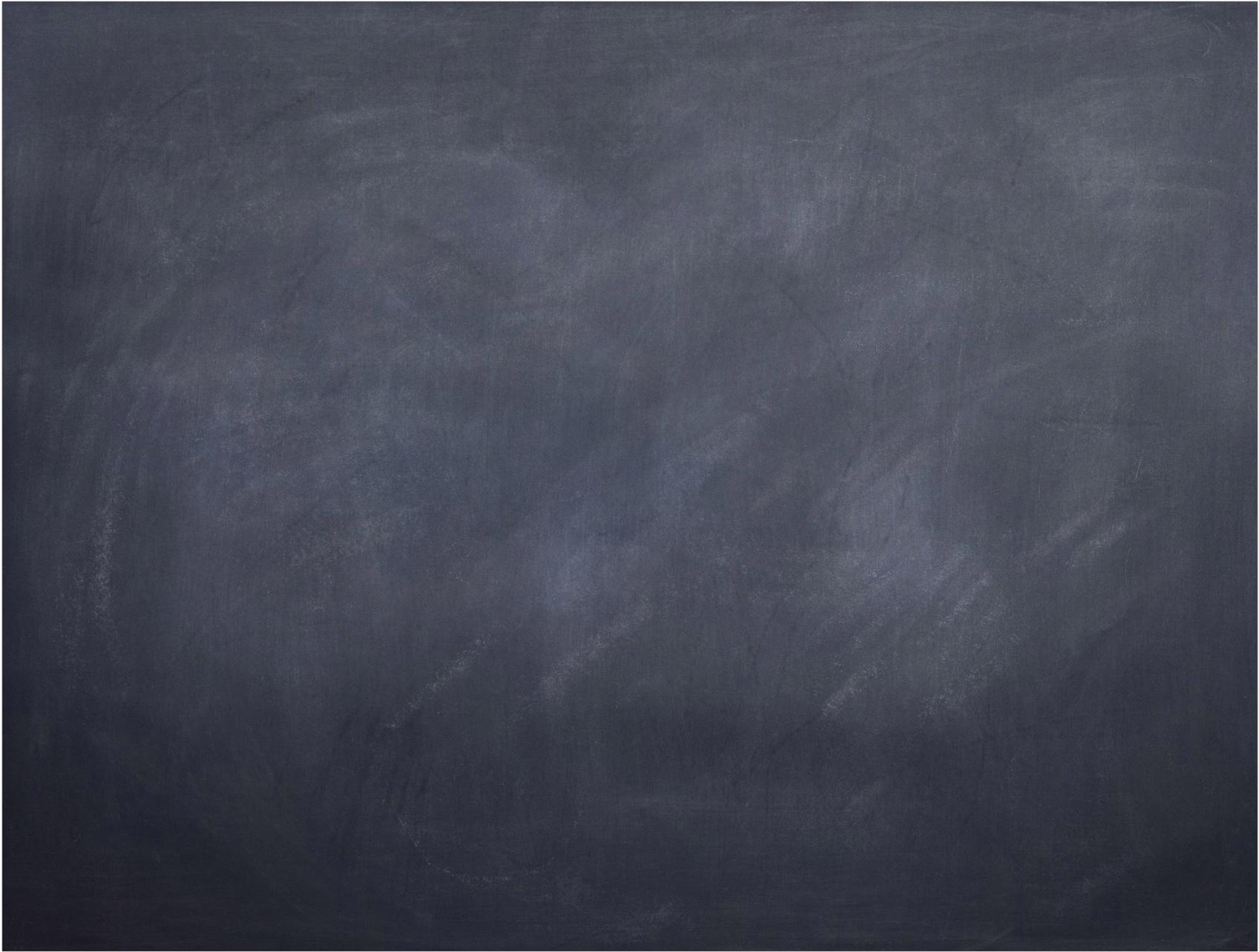


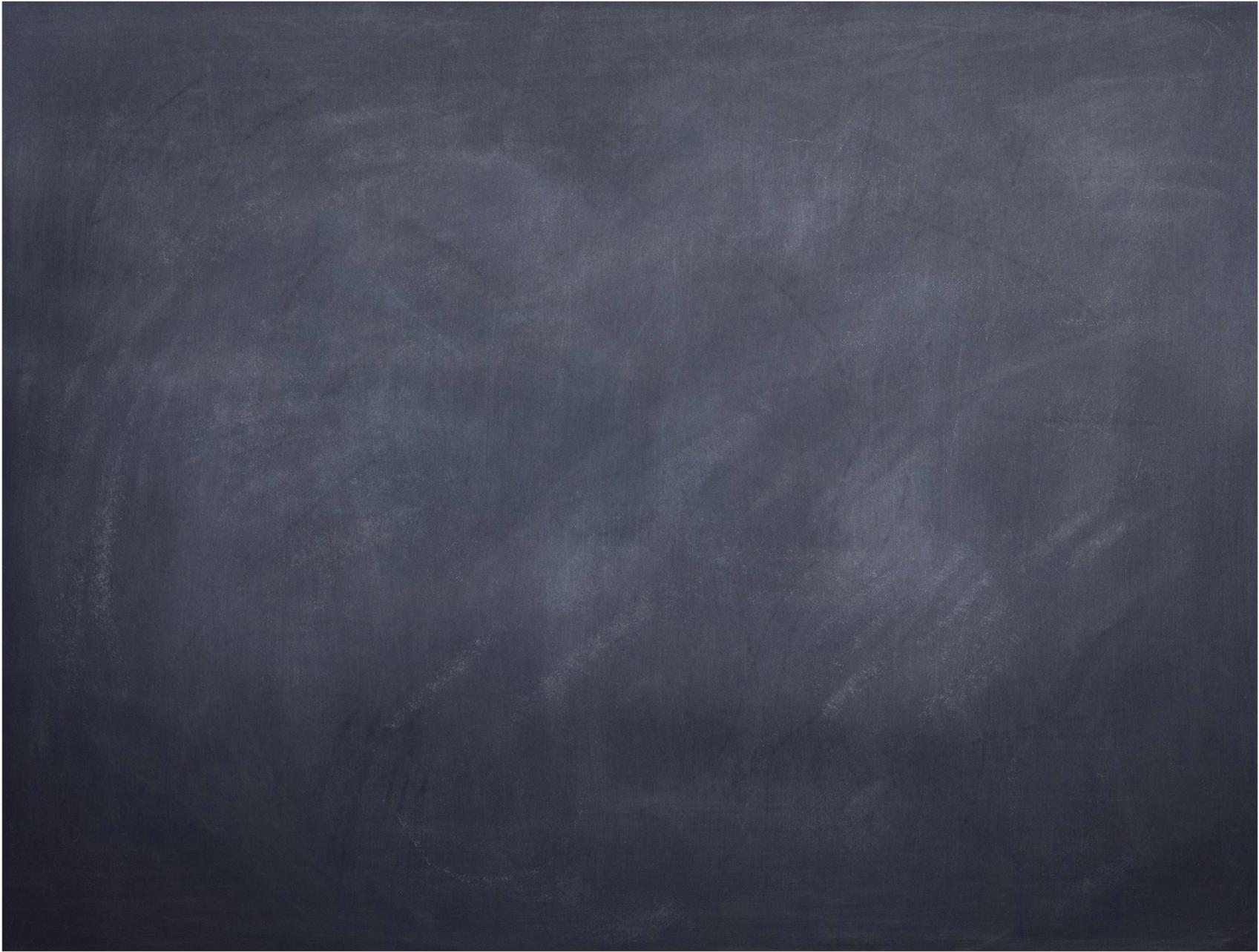
\vec{E} : $\uparrow \downarrow \uparrow \downarrow$
 \vec{B} : $\rightarrow \leftarrow \rightarrow \leftarrow$
 \vec{z} : \rightarrow

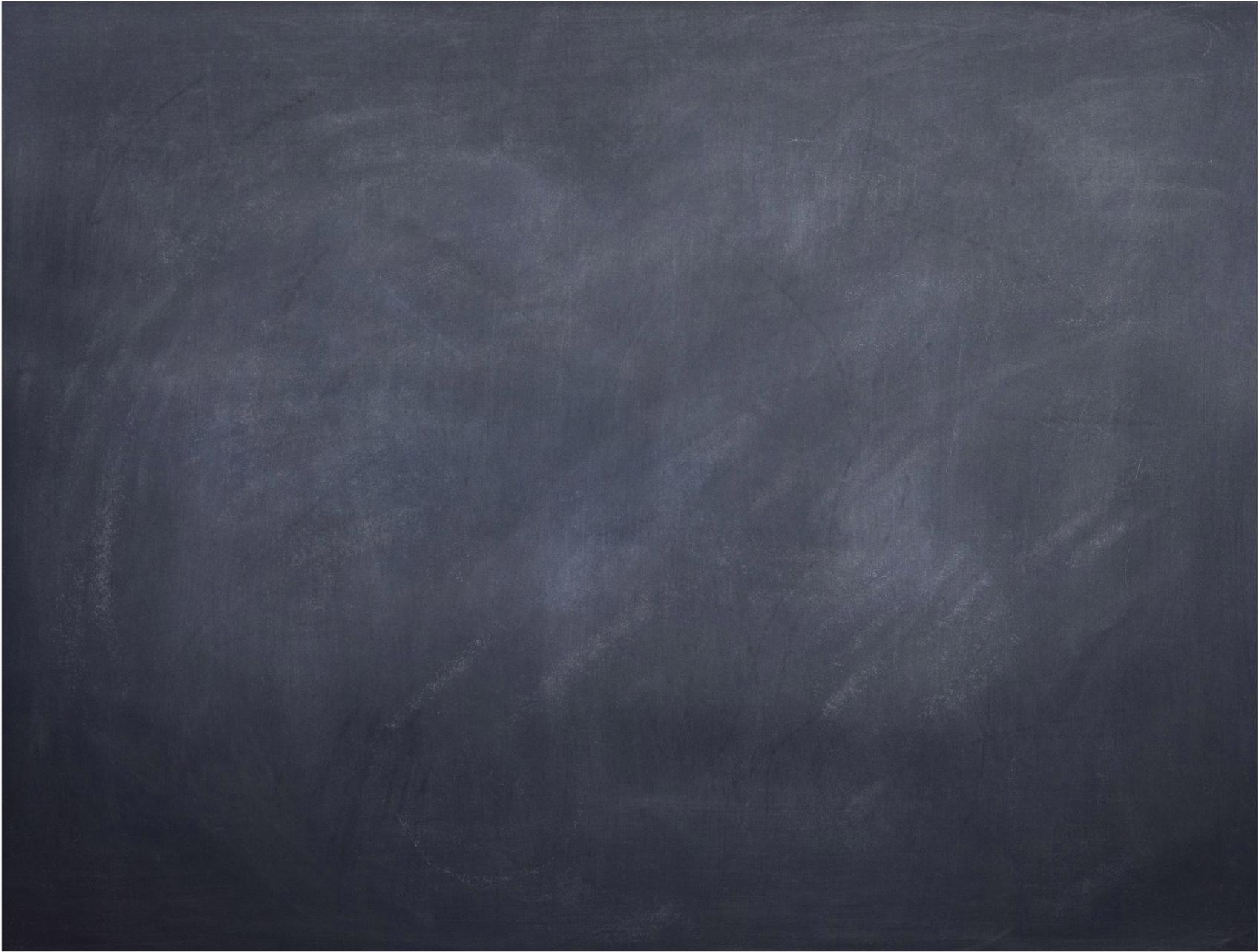


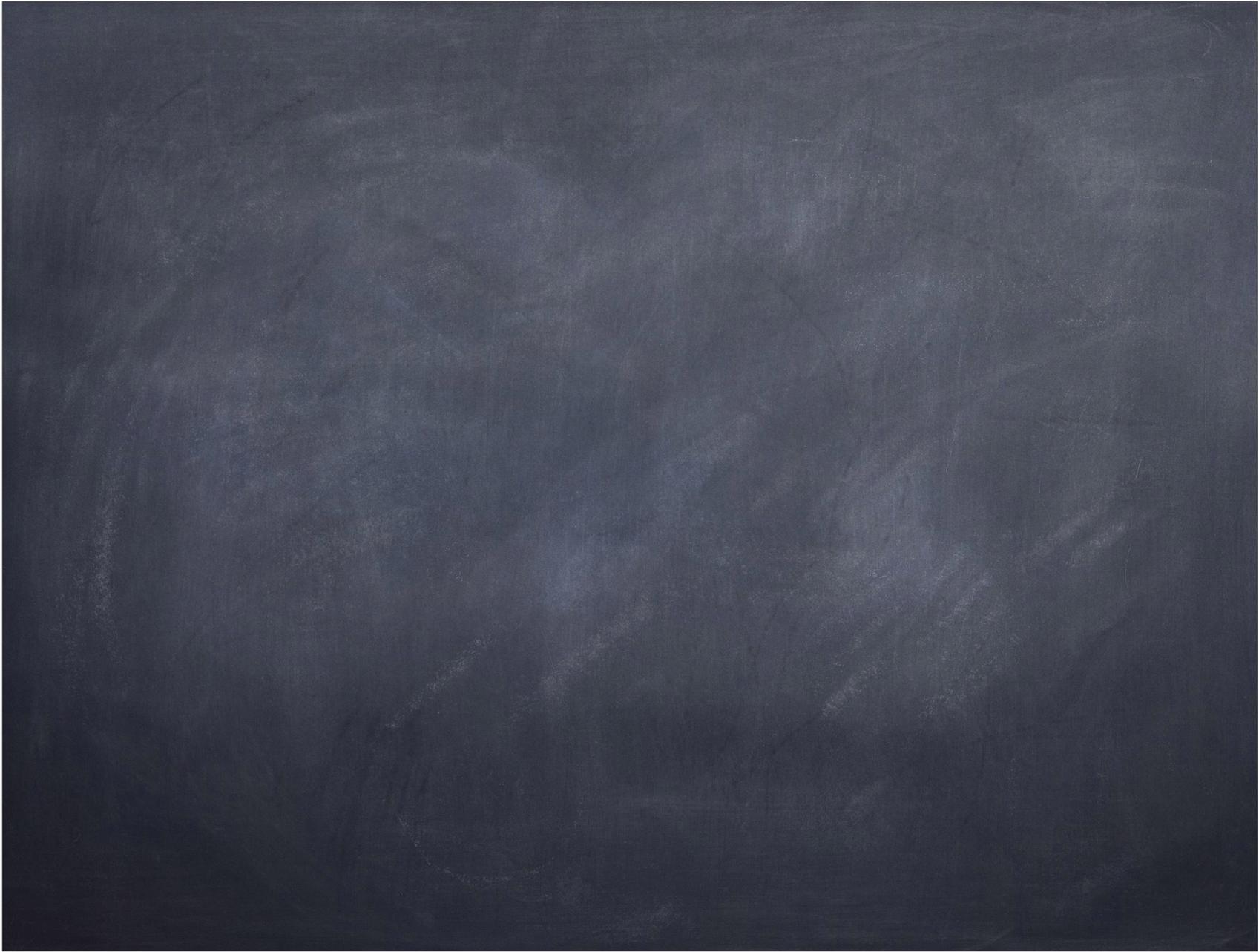






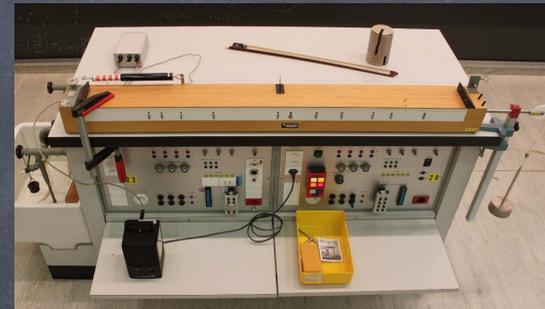








W18



W14



W36



M83