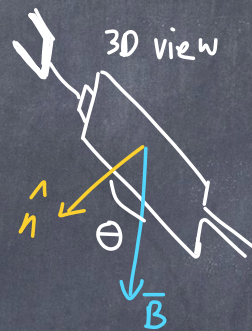
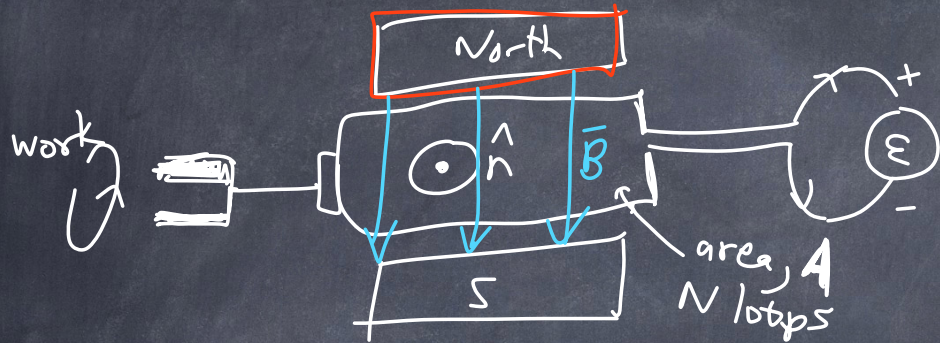


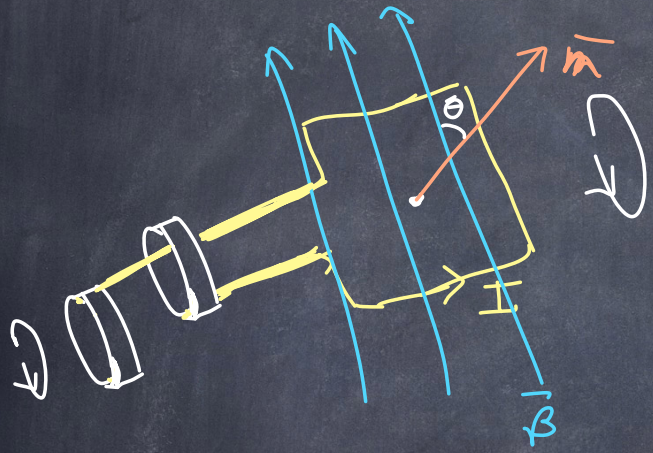
PHY 117 HS2023

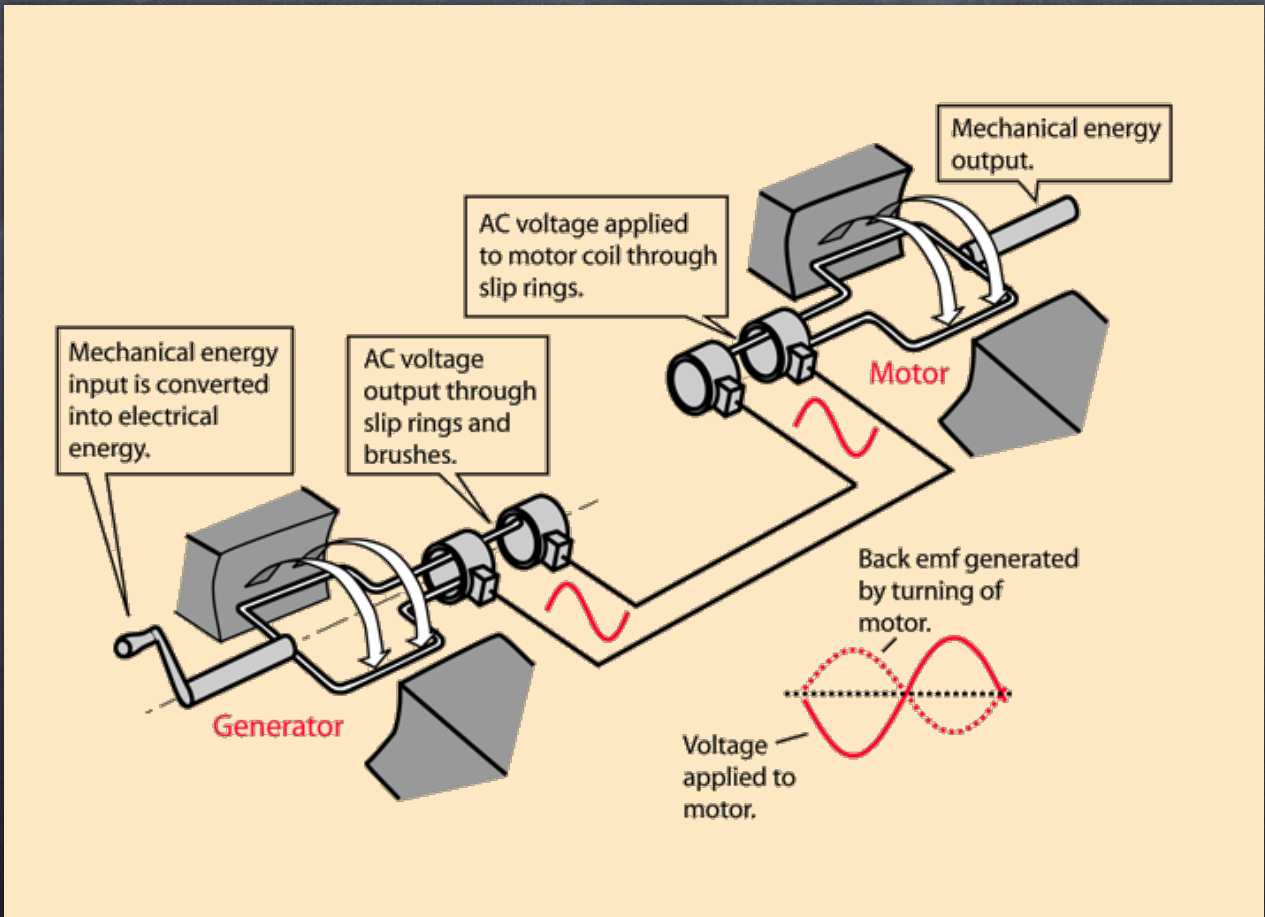
Week 11, Lecture 1

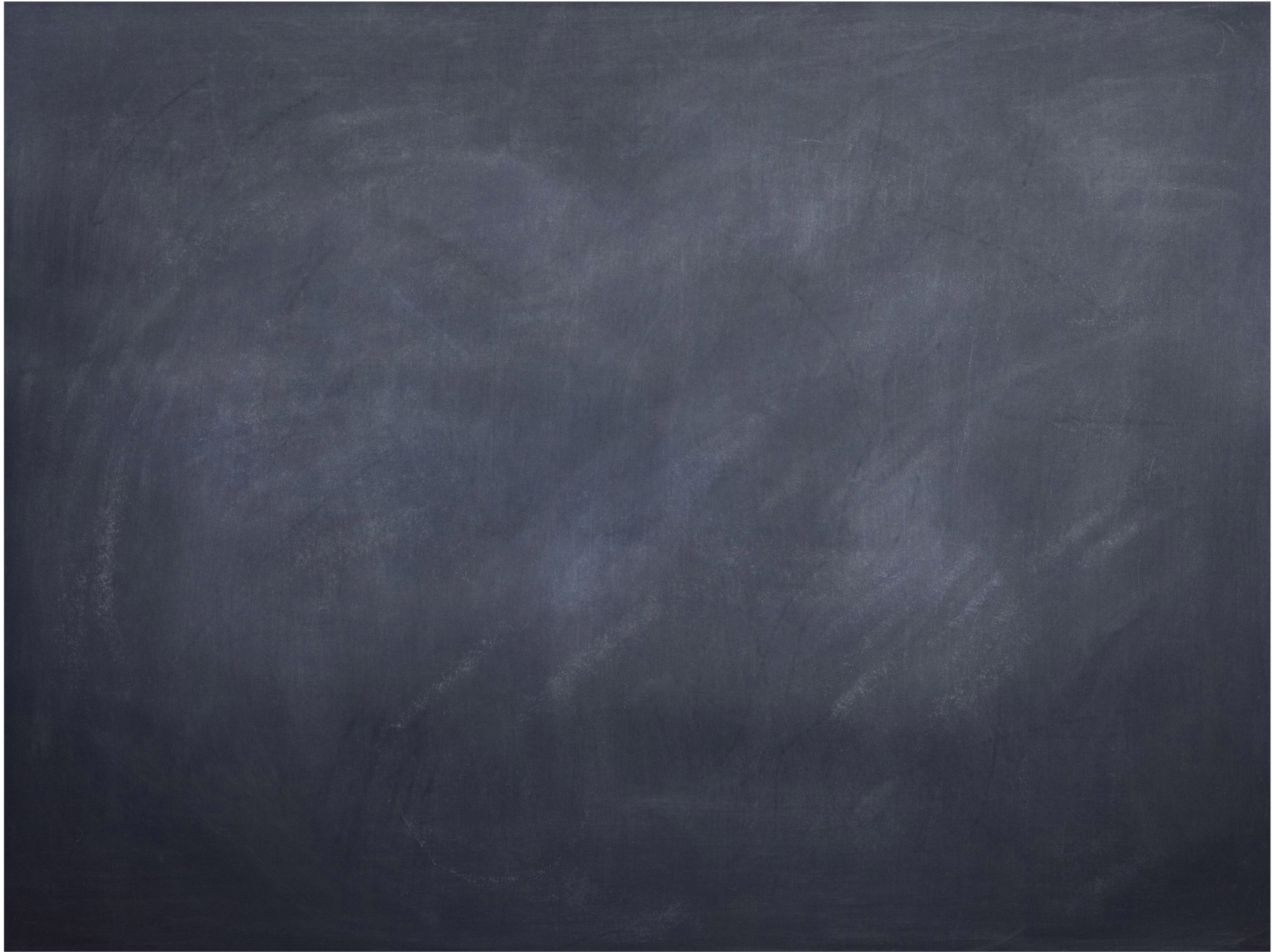
Nov. 28th, 2023

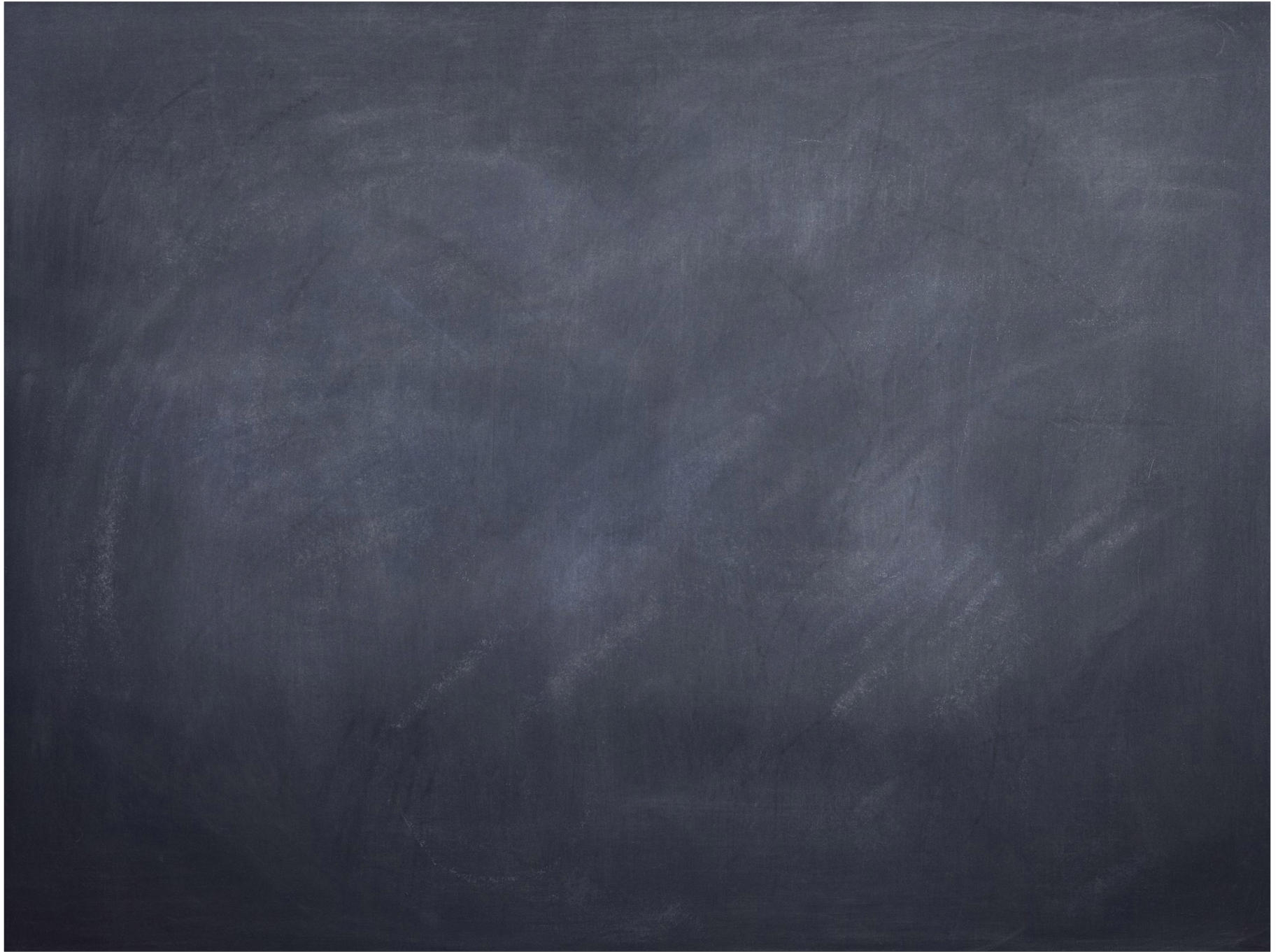
Prof. Ben Kilminster

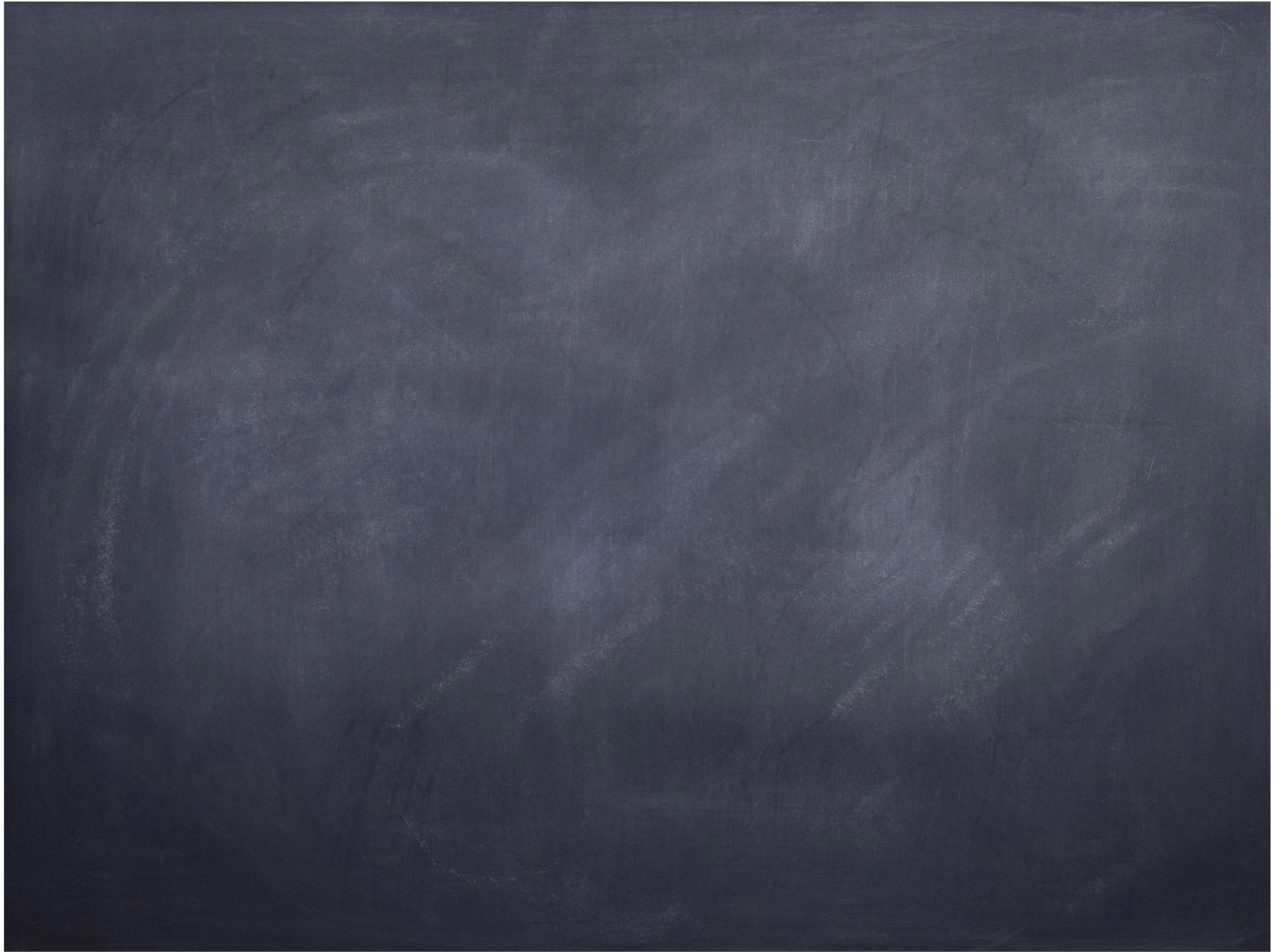






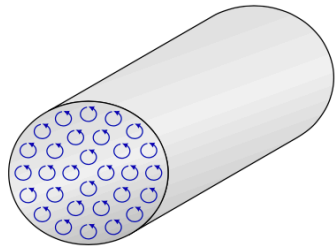




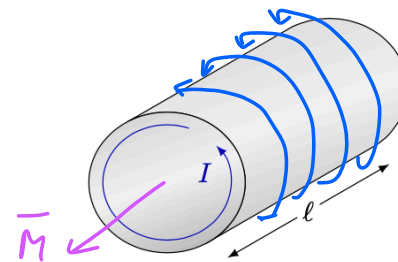


11.3. MAGNETIZATION

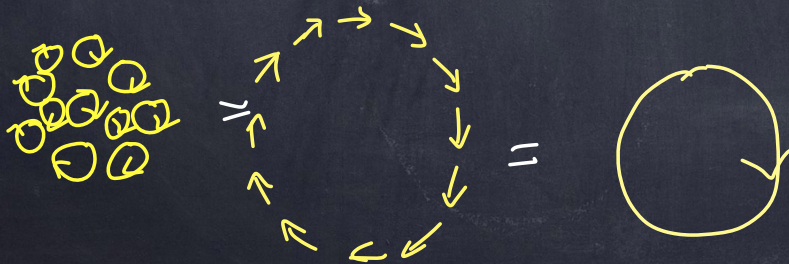
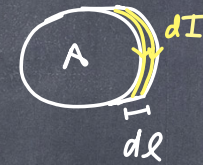
115



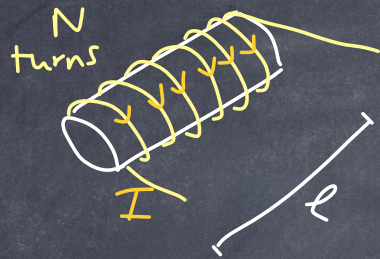
(a) Each atom has its own small current loops, and their own magnetic moment.



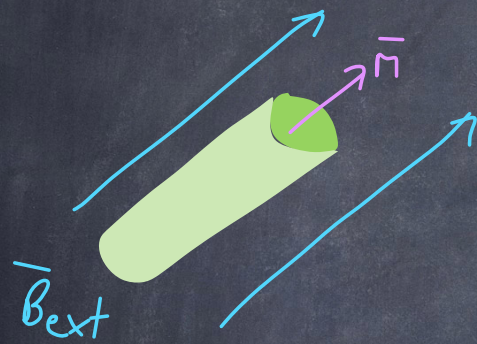
(b) One can think of the microscopic currents adding up to one big one.

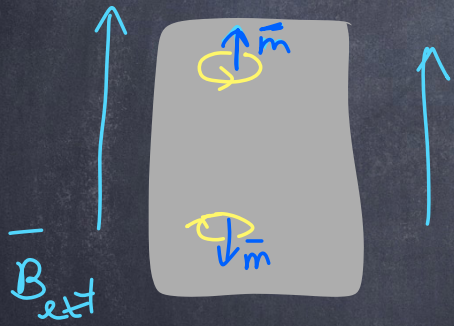


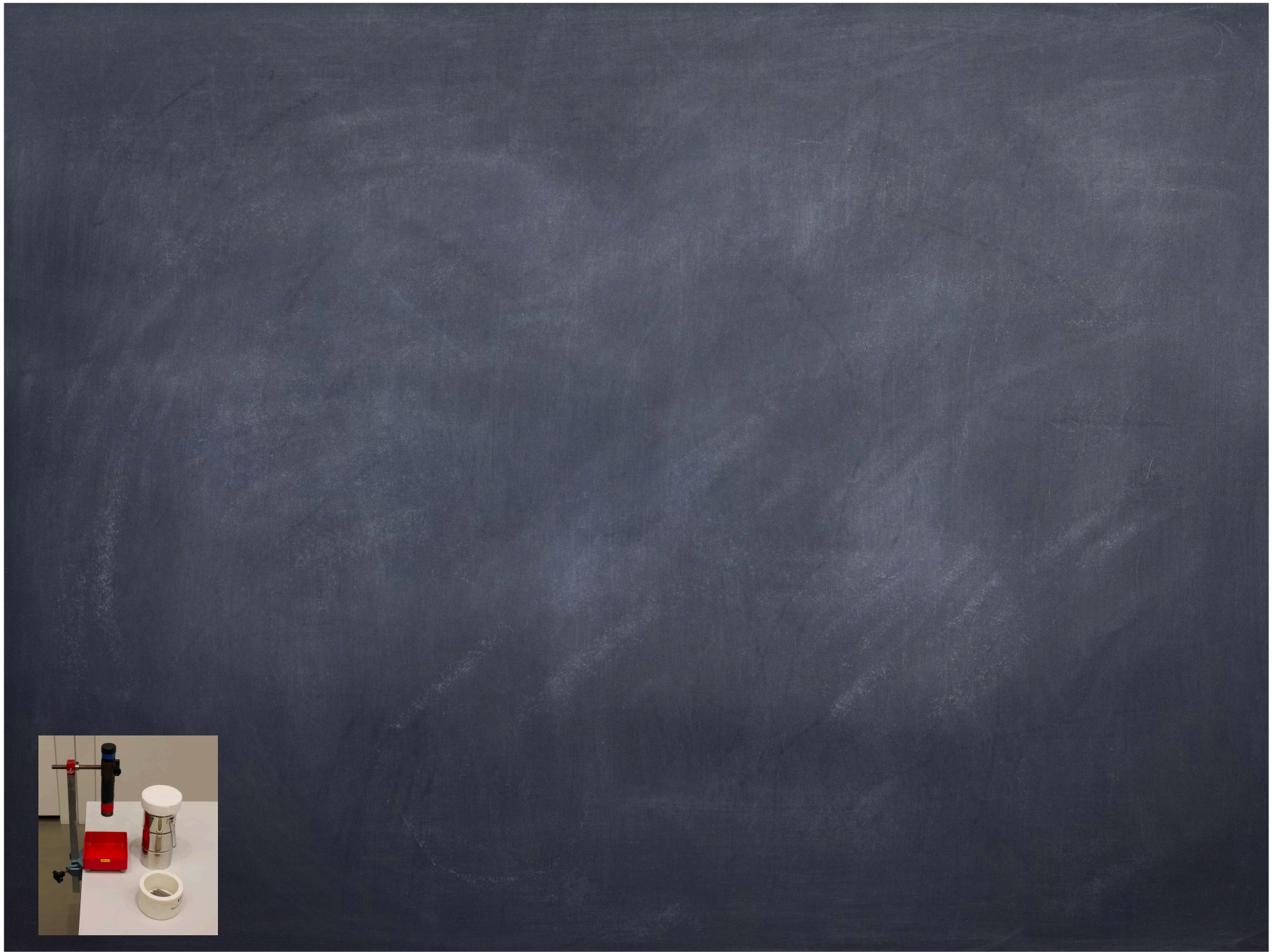
Magnetic moment of hollow solenoid:



<u>material</u>	<u>χ_m</u>
Al	2.3×10^{-5}
Gold	-3.6×10^{-5}
BismutL	-1.66×10^{-5}
nickel	600
iron pure	200,000
Copper	-9.6×10^{-6}
water	-9×10^{-6}
graphite	$(1 \times 10^{-5}, 1 \times 10^{-3})$ (depends on orientation)

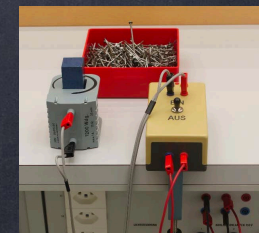
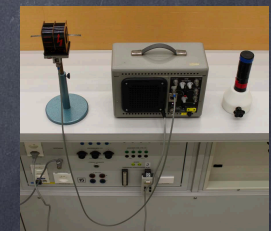
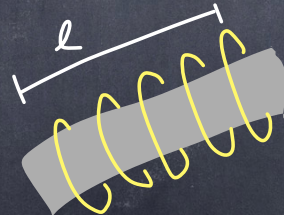


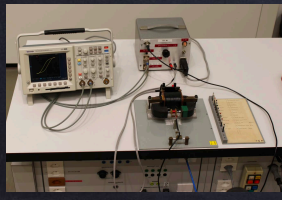
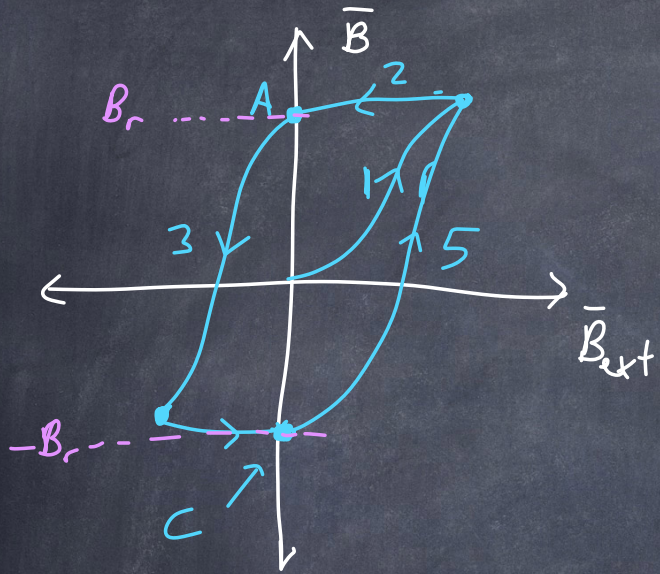






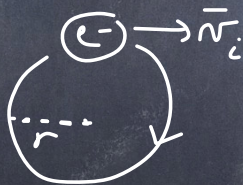
Put iron into a solenoid.



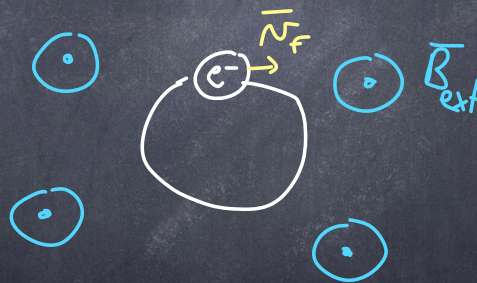


from earlier:

Before:



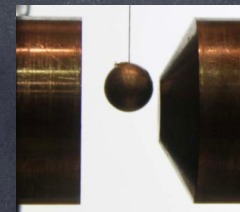
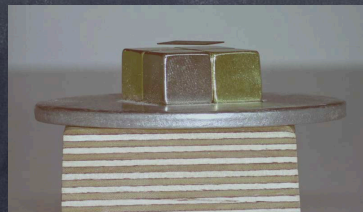
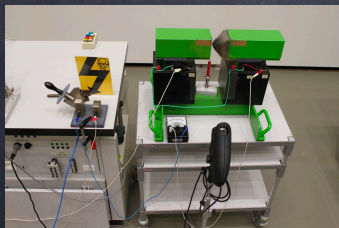
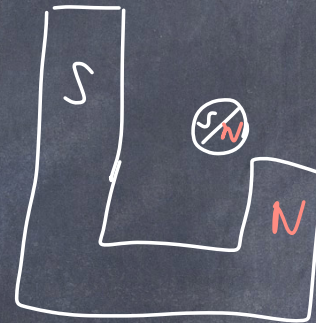
After:

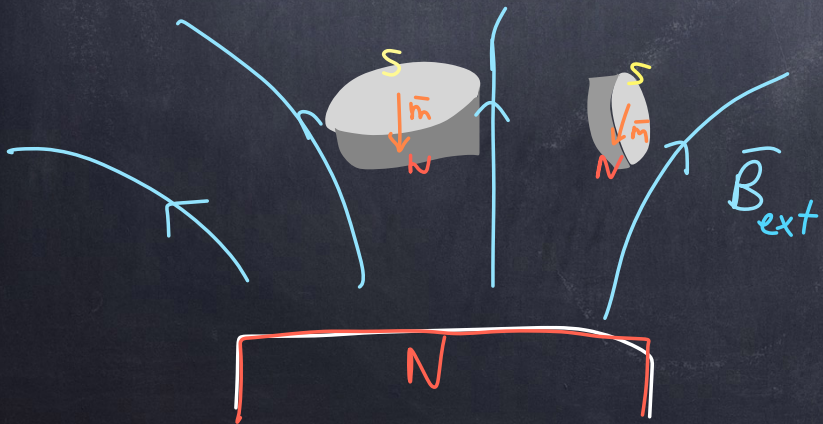
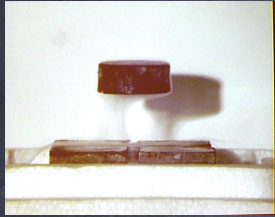


S



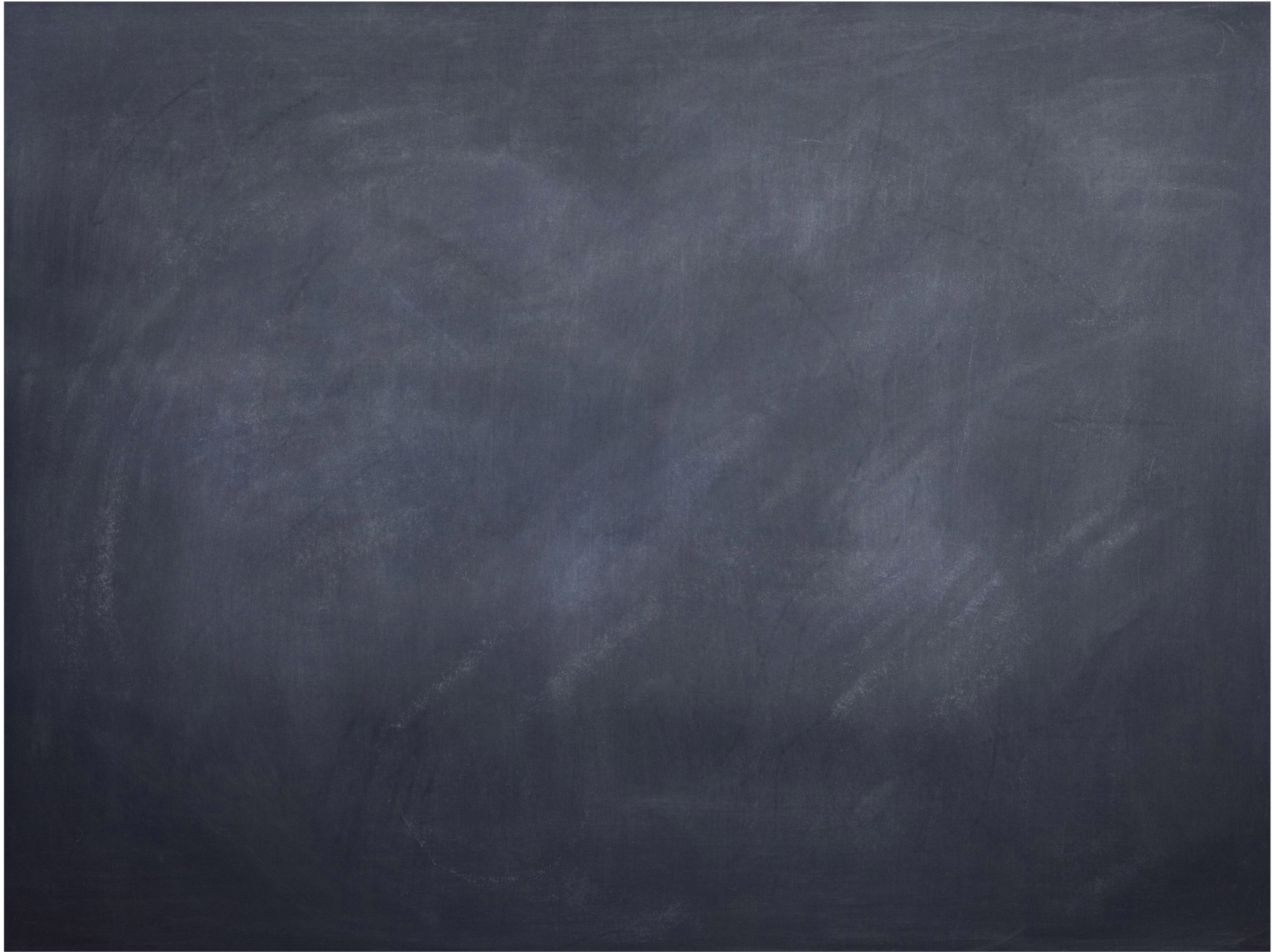
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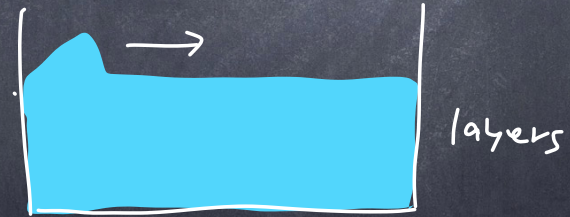
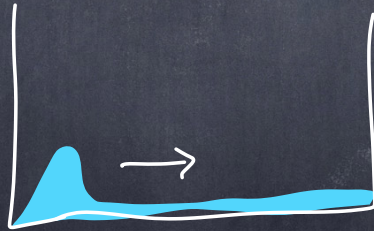


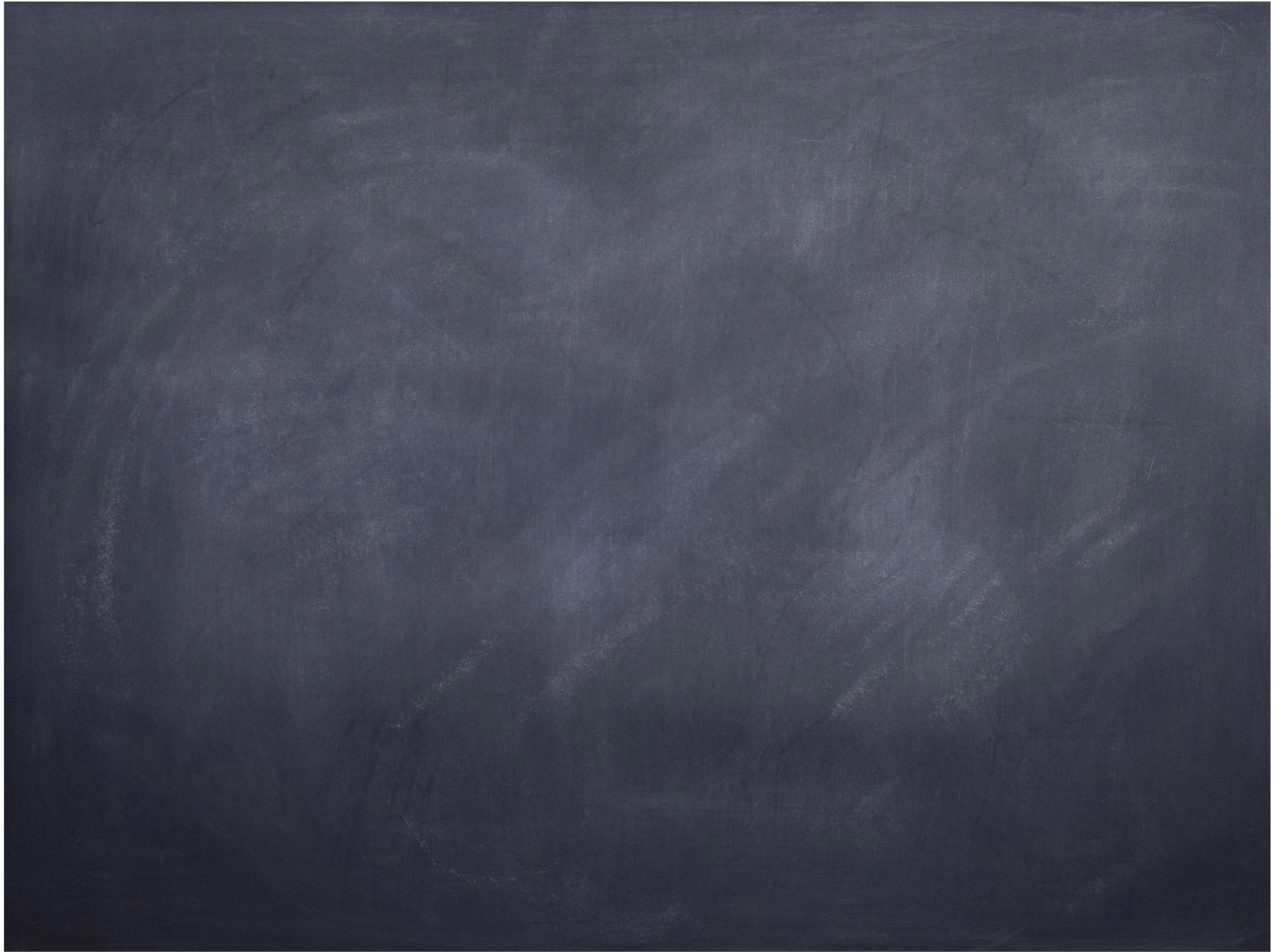


WAVES

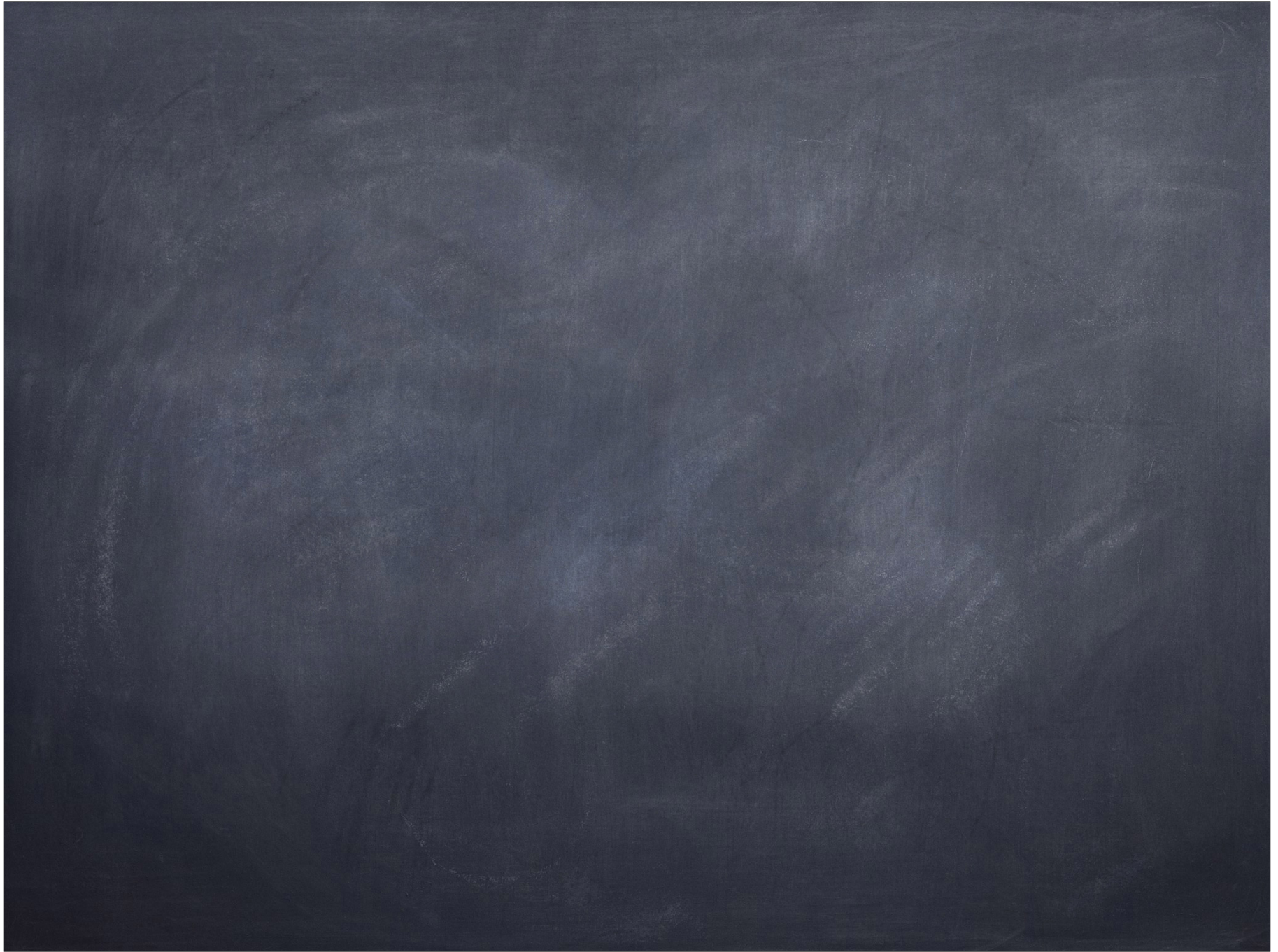


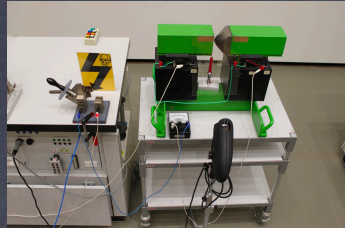




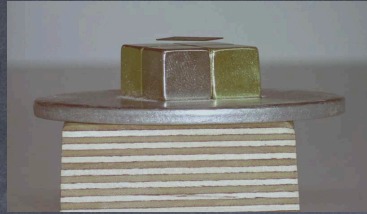




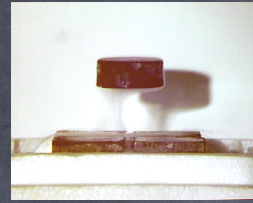




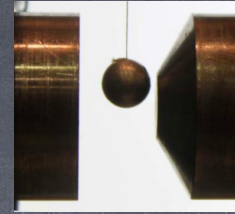
ED28



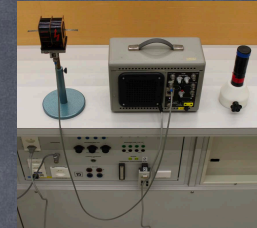
ED29



ED30



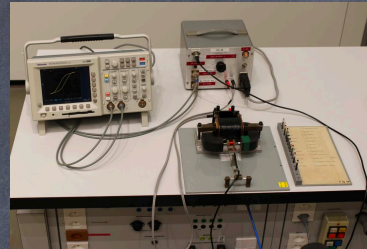
ED32



ED34



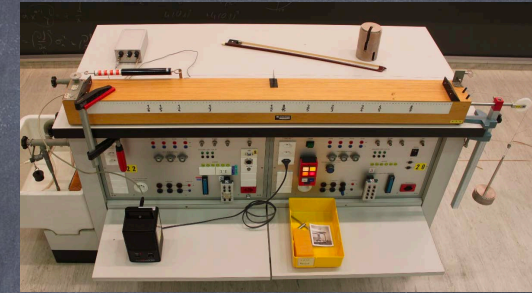
ED35



ED40



ED41



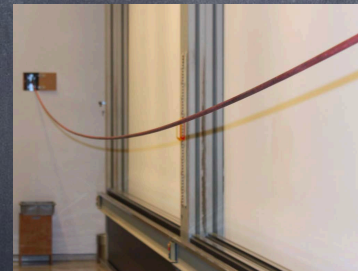
W14



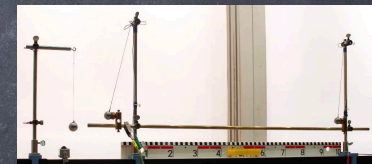
W18



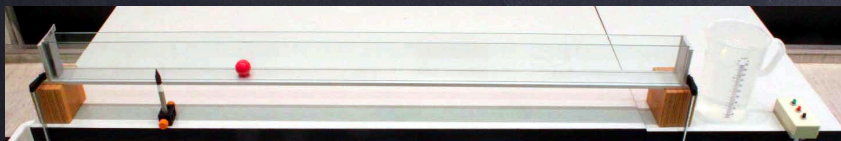
W24



W28



W32



W31



W33