

# spooky bits

an intro to quantum computing

( october 2014 )



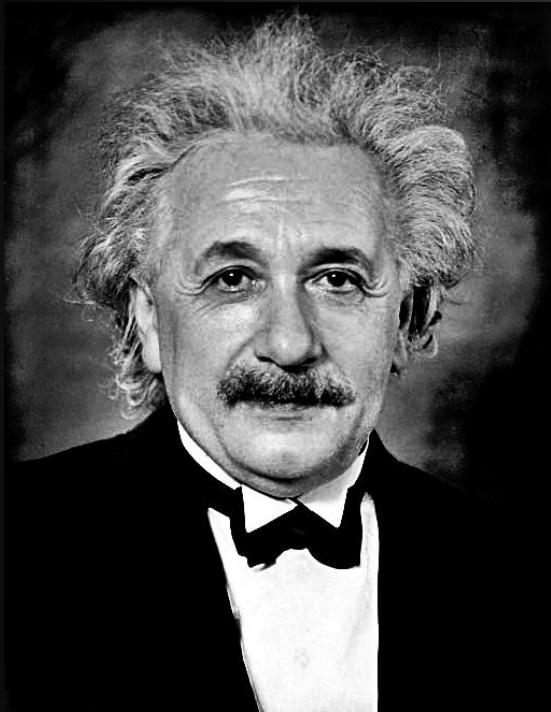
if quantum mechanics hasn't profoundly  
shocked you, you haven't understood it yet

Niels Bohr



science cannot solve the ultimate mystery of nature.  
and that is because, in the last analysis, we ourselves  
are a part of the mystery that we are trying to solve

Max Planck



“spooky action at a distance”

“as i have said so many times, God does not  
play dice with the world”

Albert Einstein

( “stop telling God what to do” -- Niels Bohr )



i think i can safely say that nobody understands  
quantum mechanics

Richard Feynman



a good [mental] fight with [quantum mechanic] propositions  
is probably psychologically necessary if you are ever to get  
on top of the subject

David A. B. Miller

# what is light?



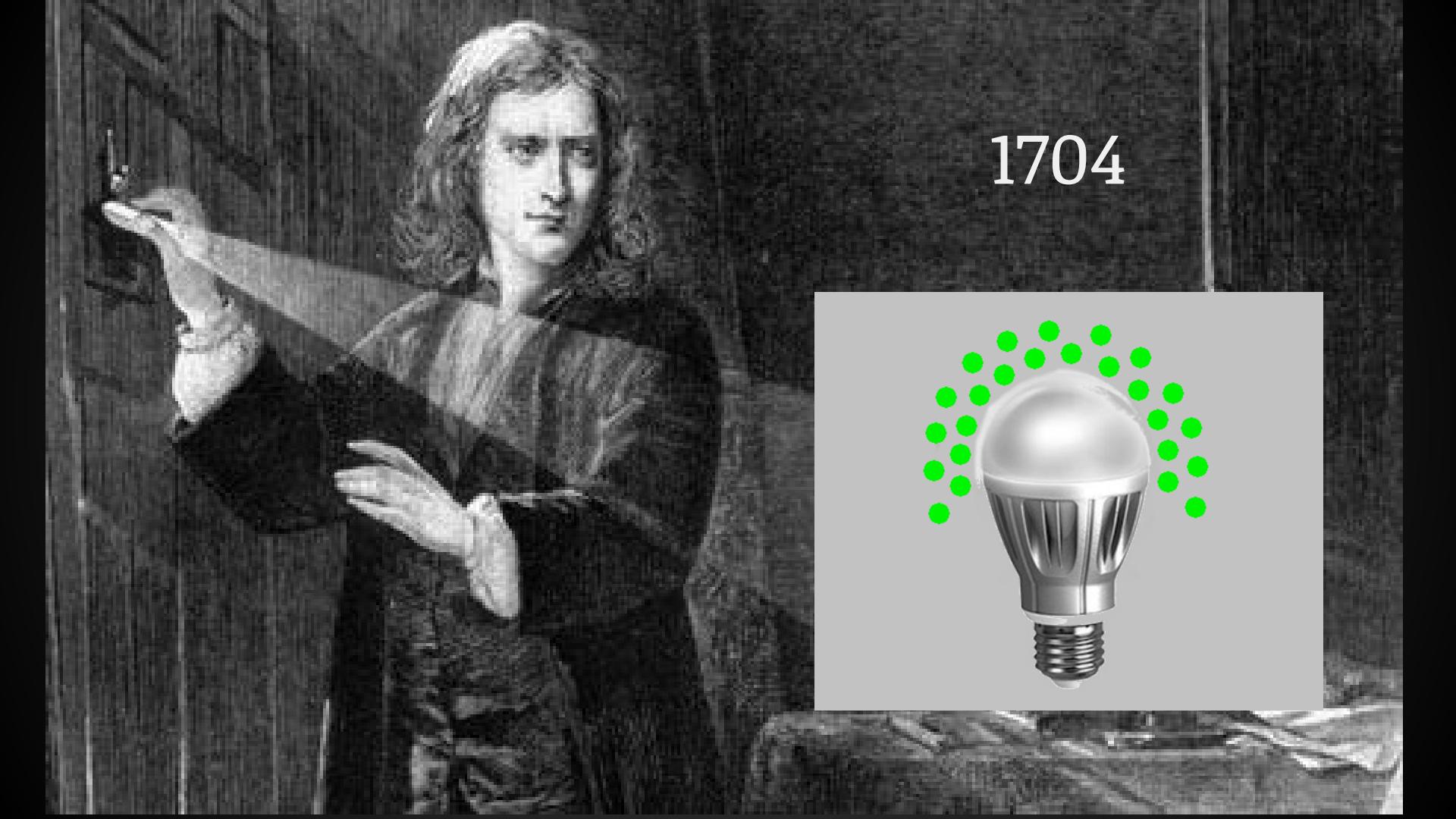
or





1678





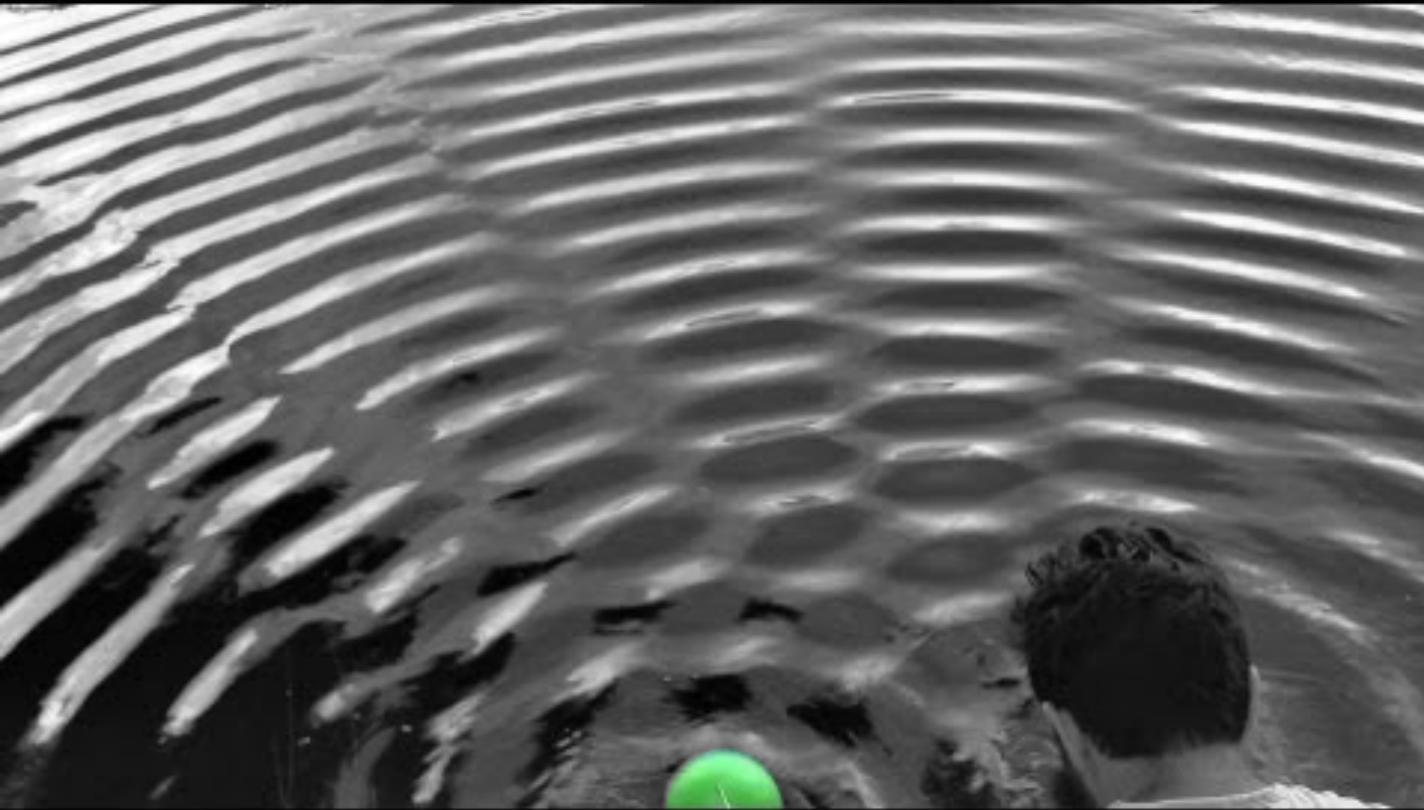
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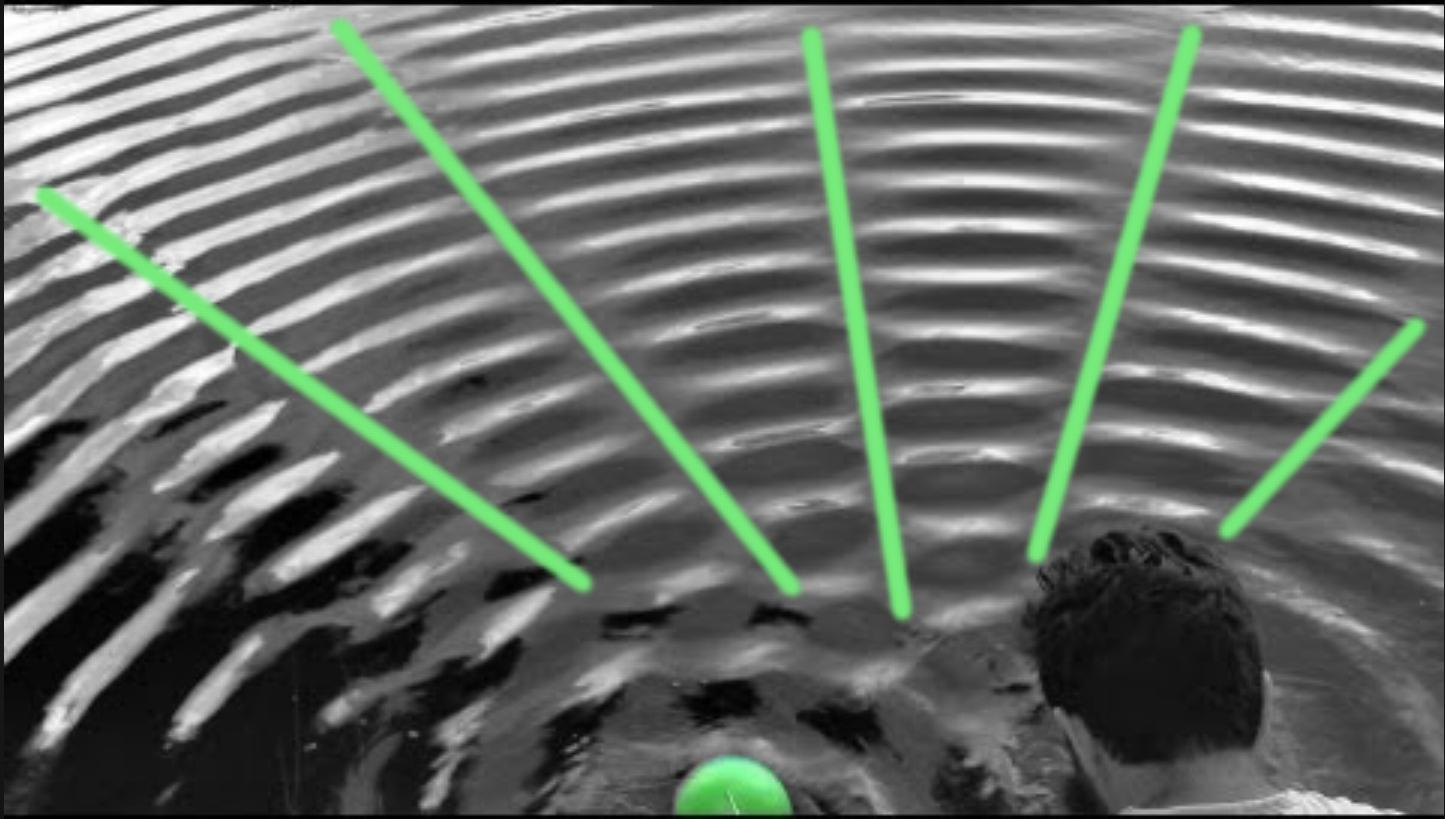


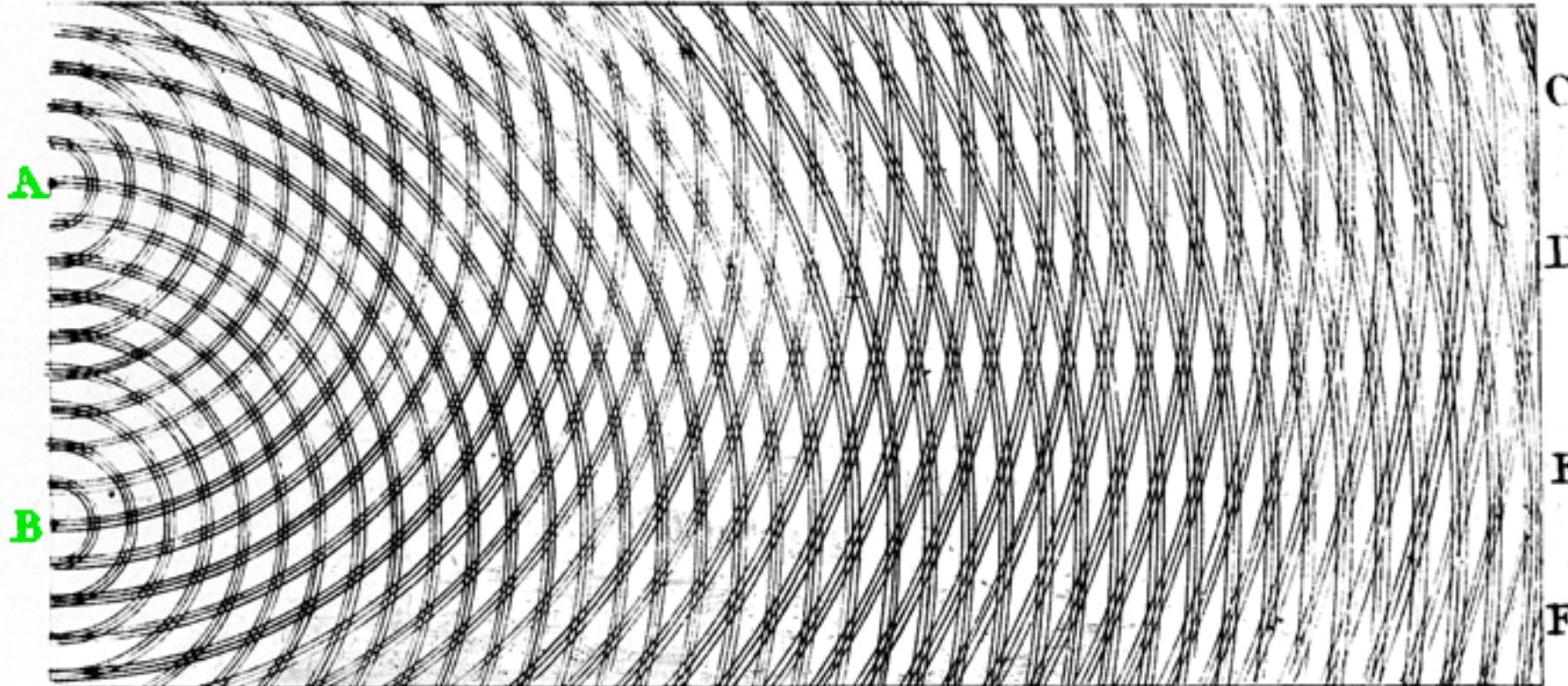


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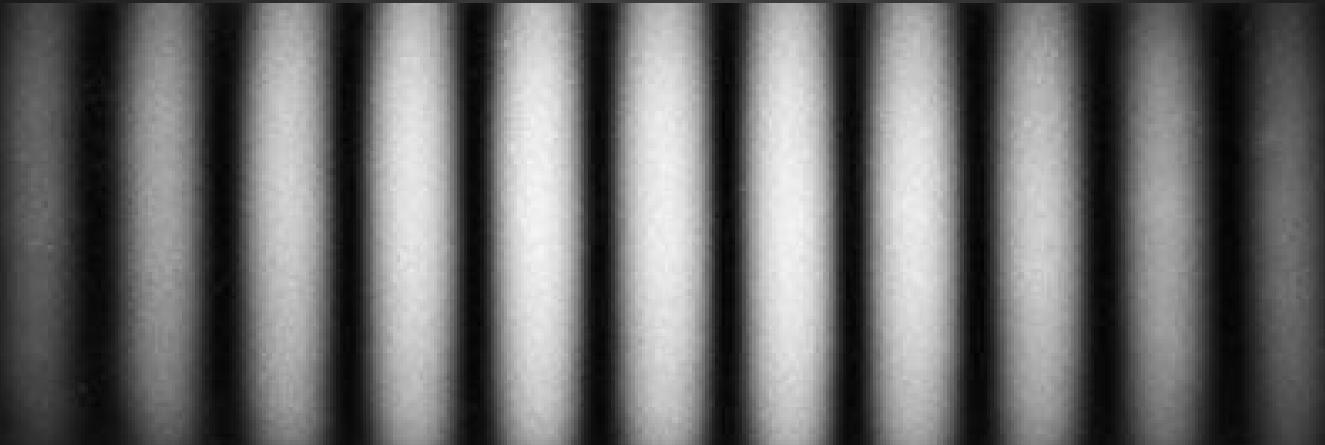


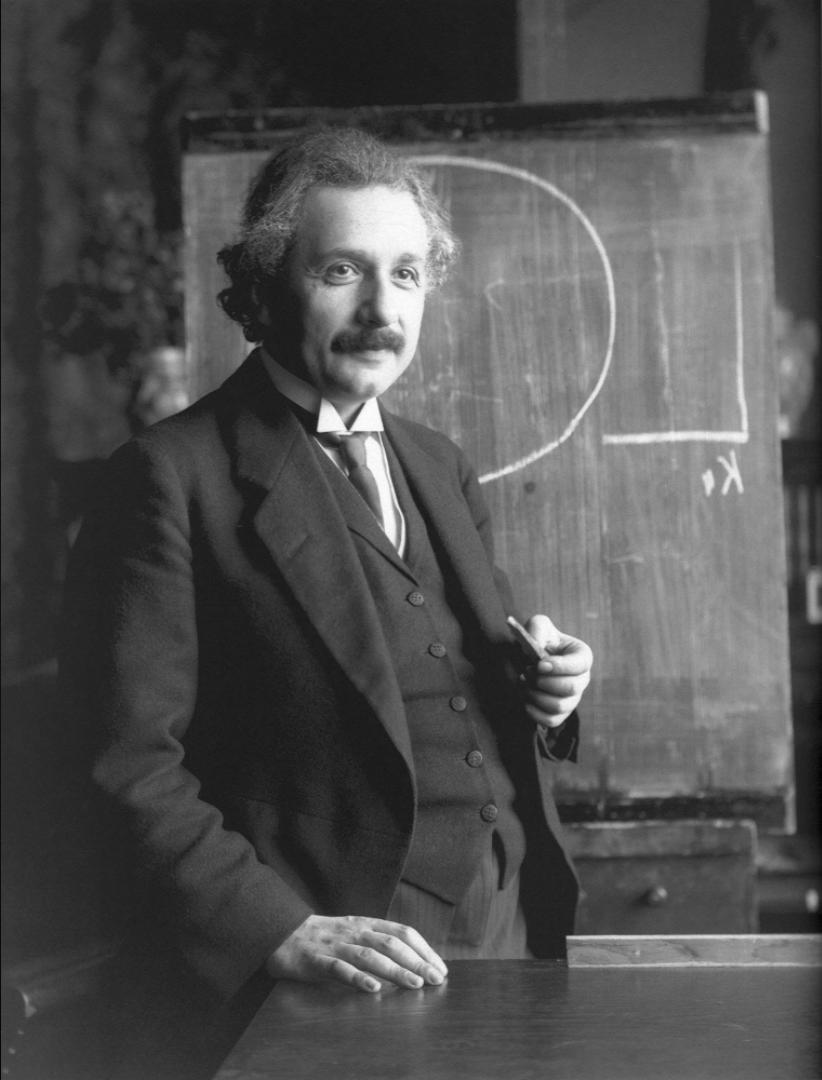






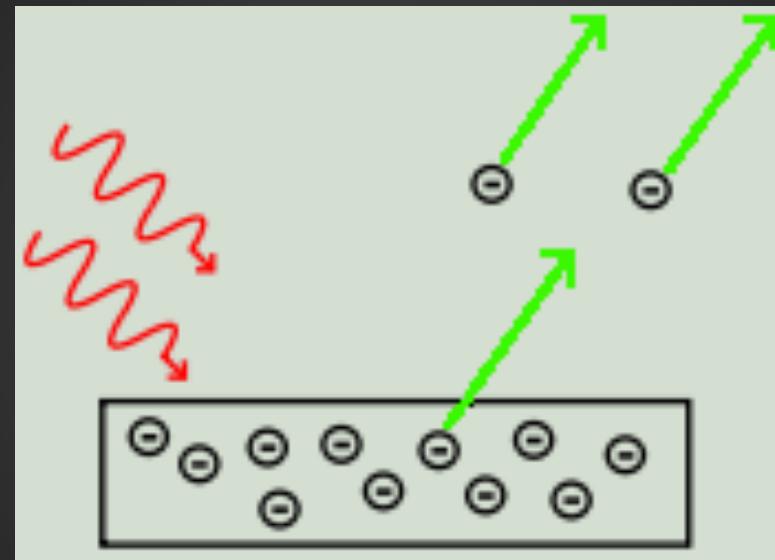
interference



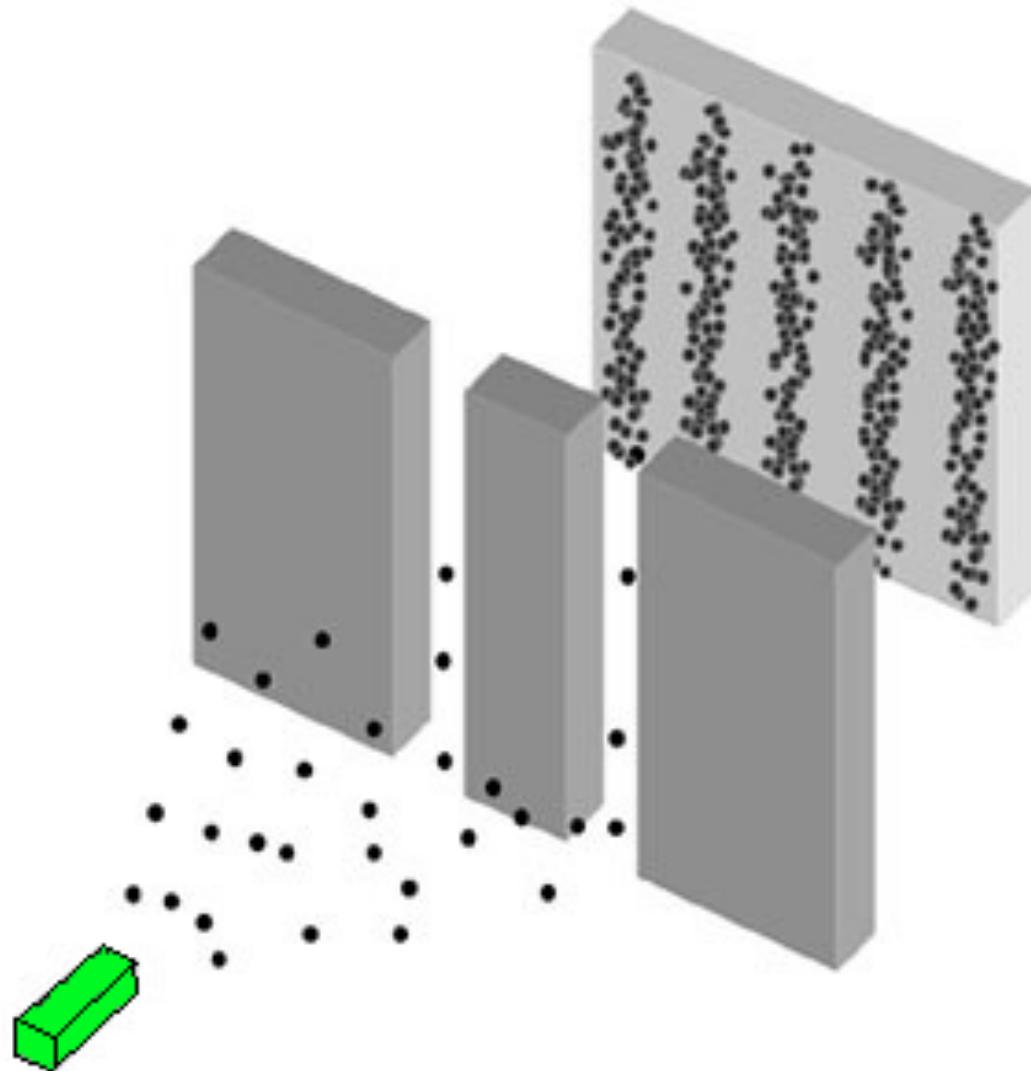


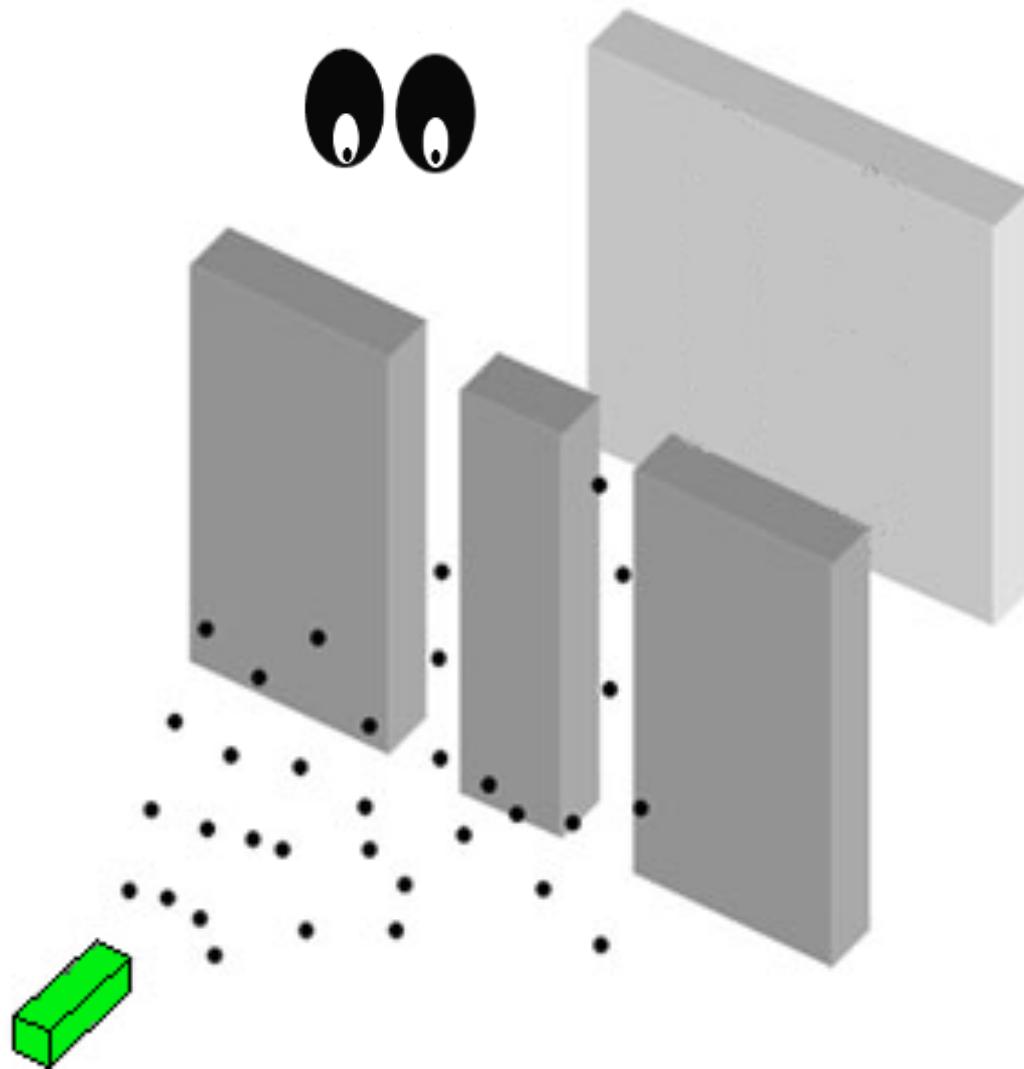
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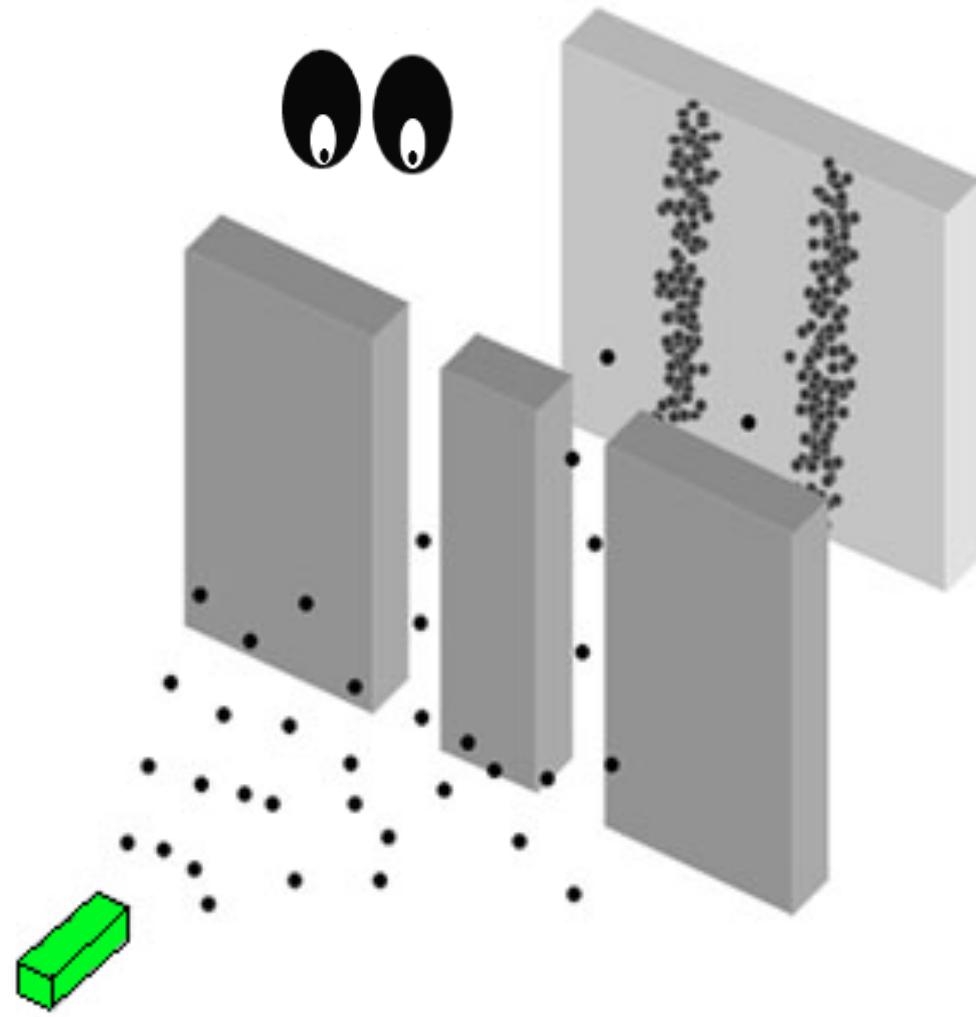


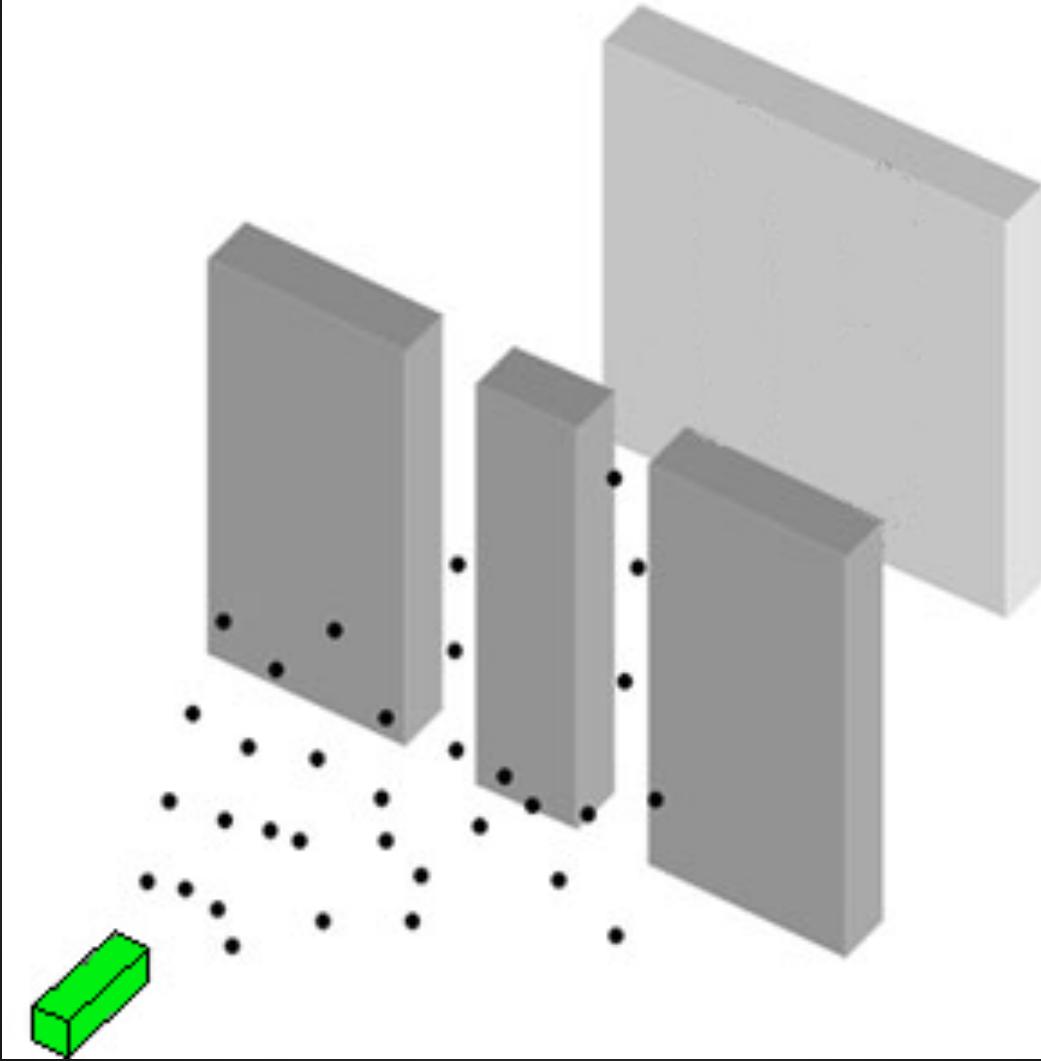


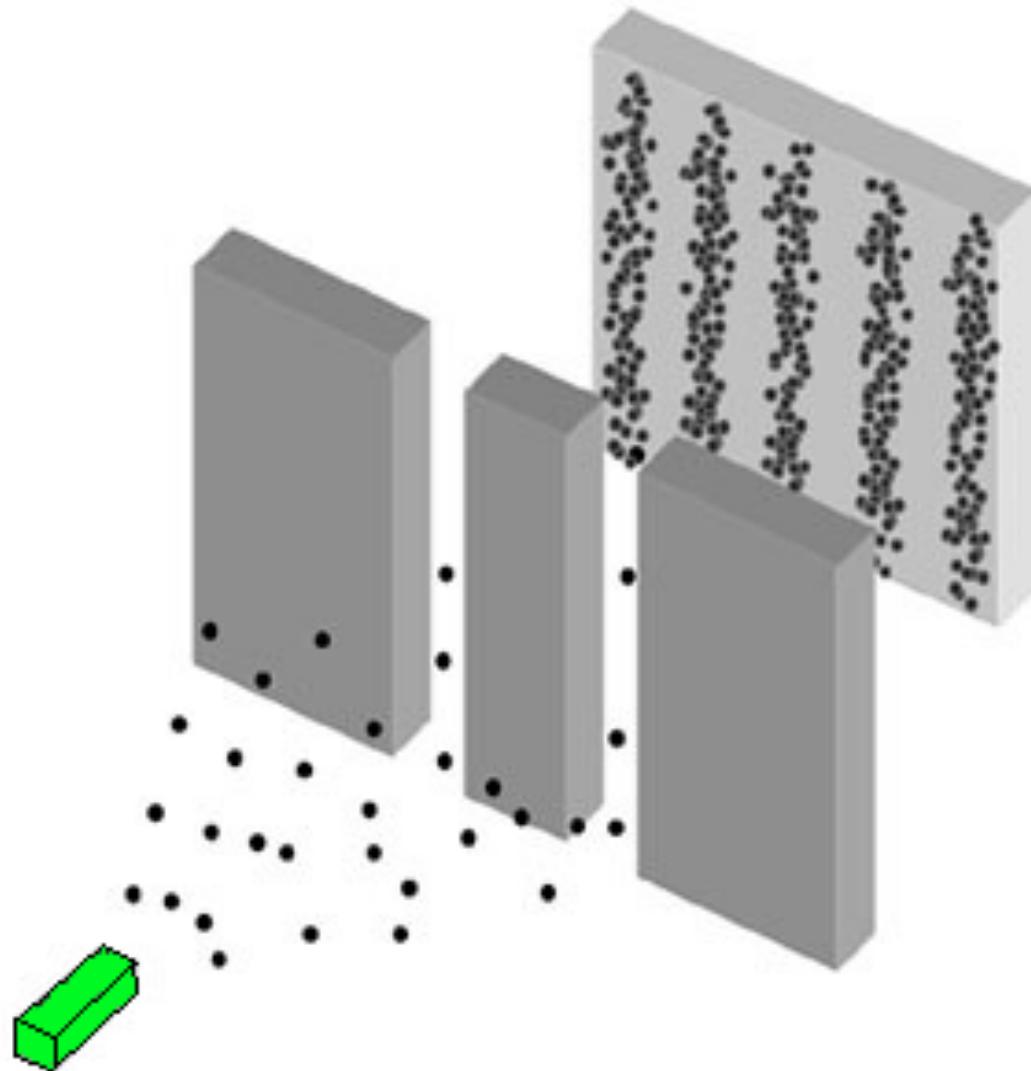




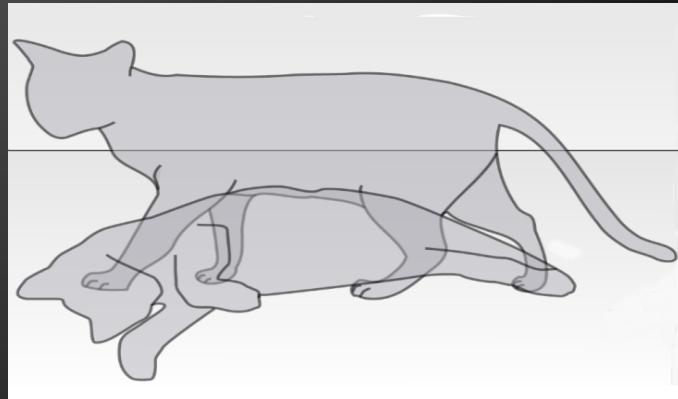
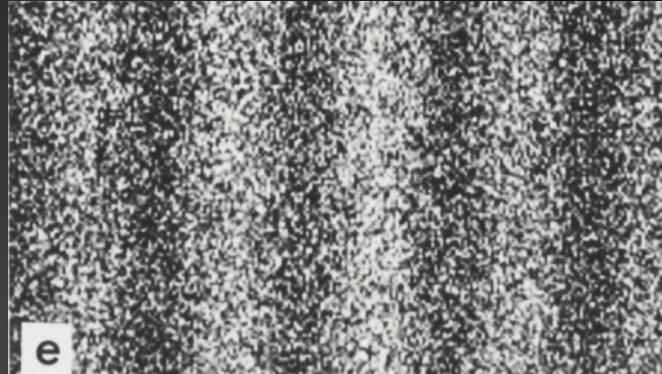
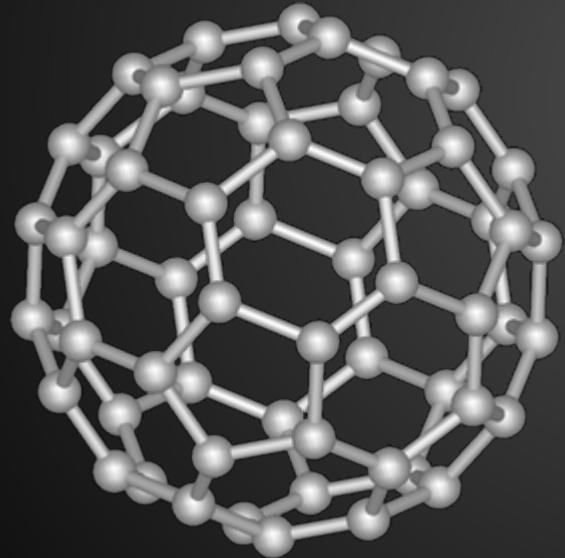
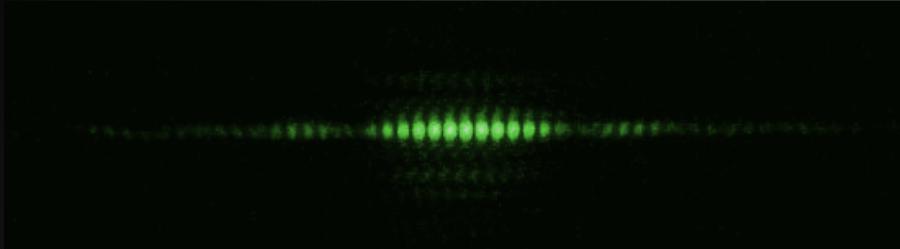


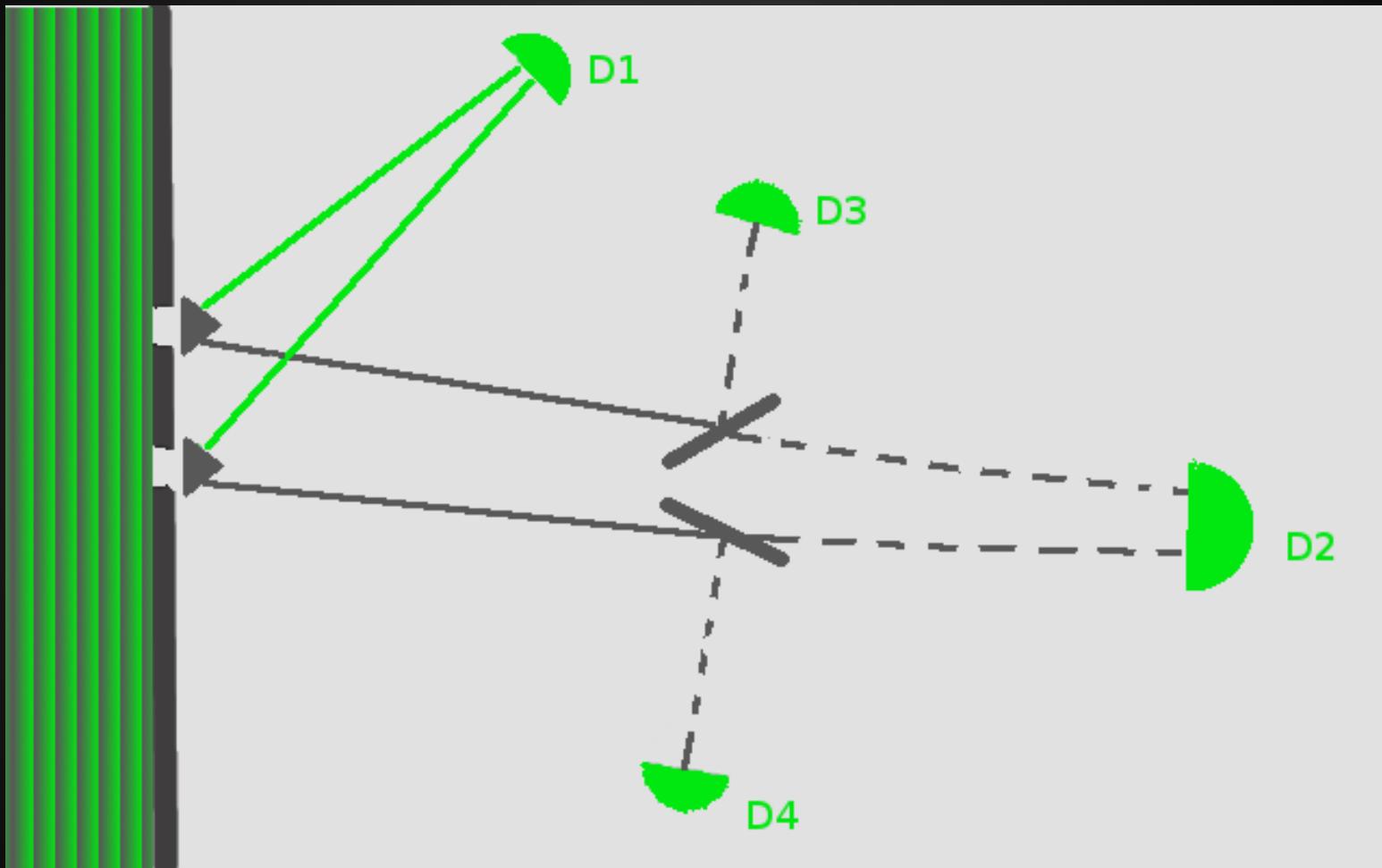


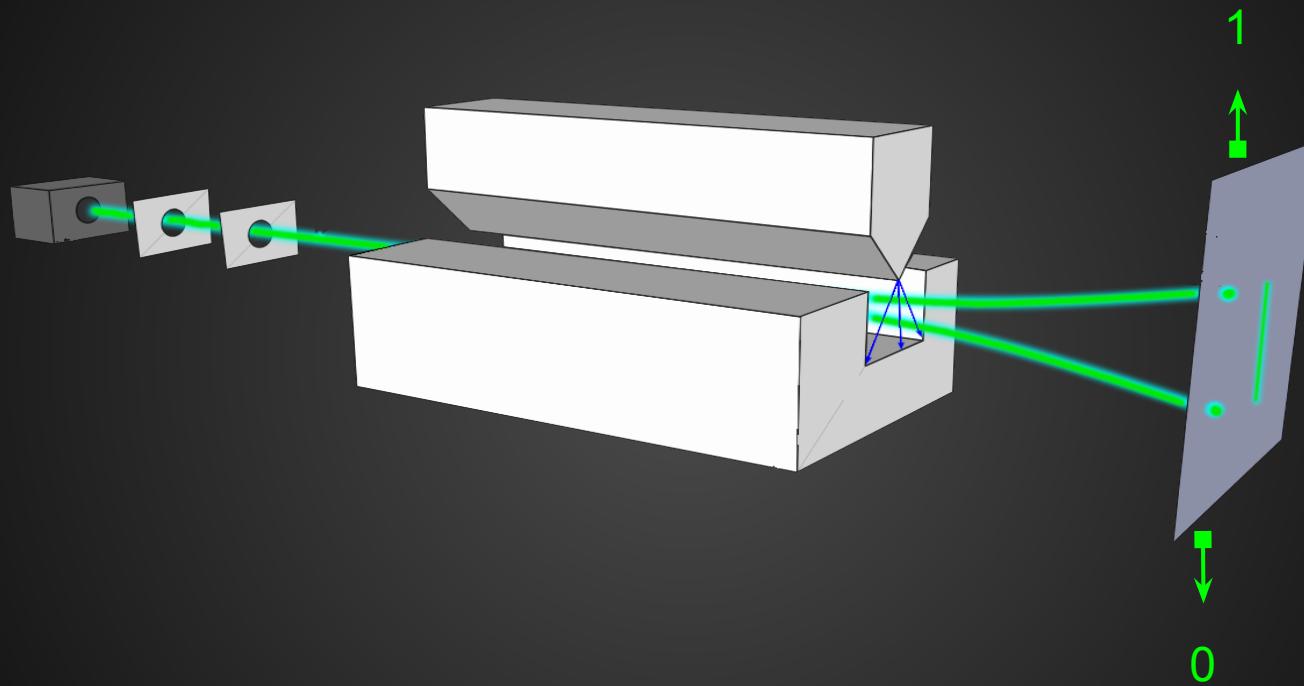


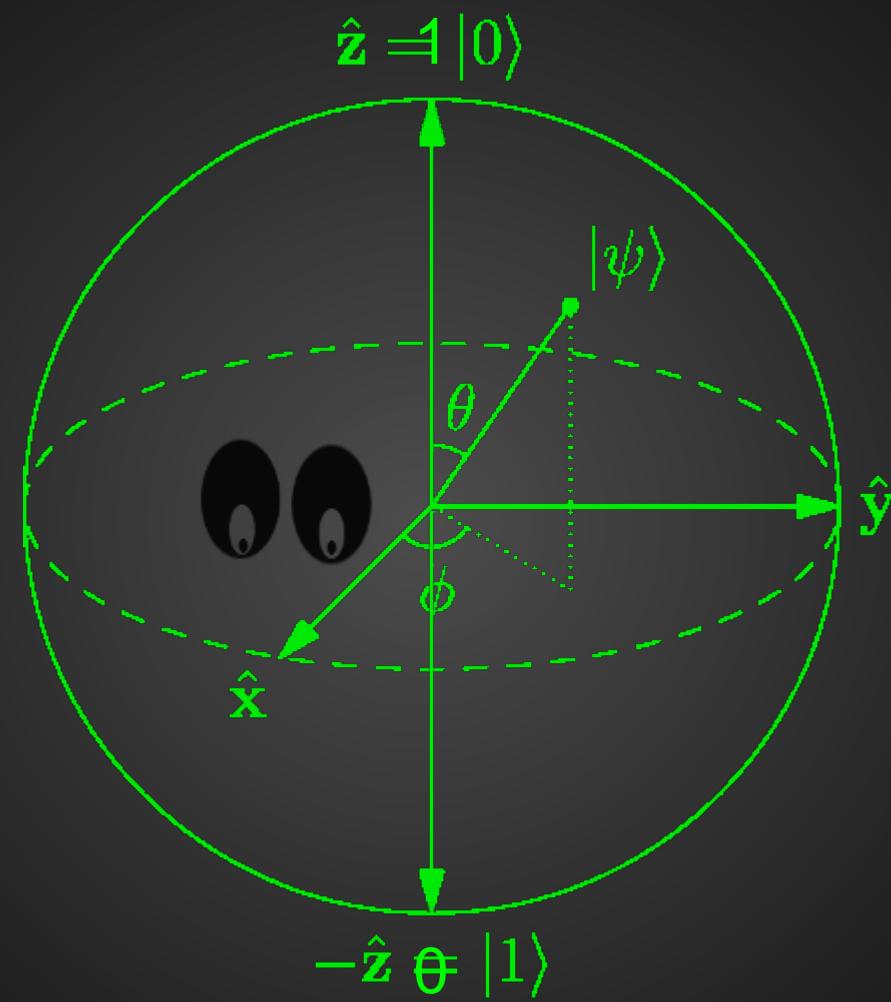


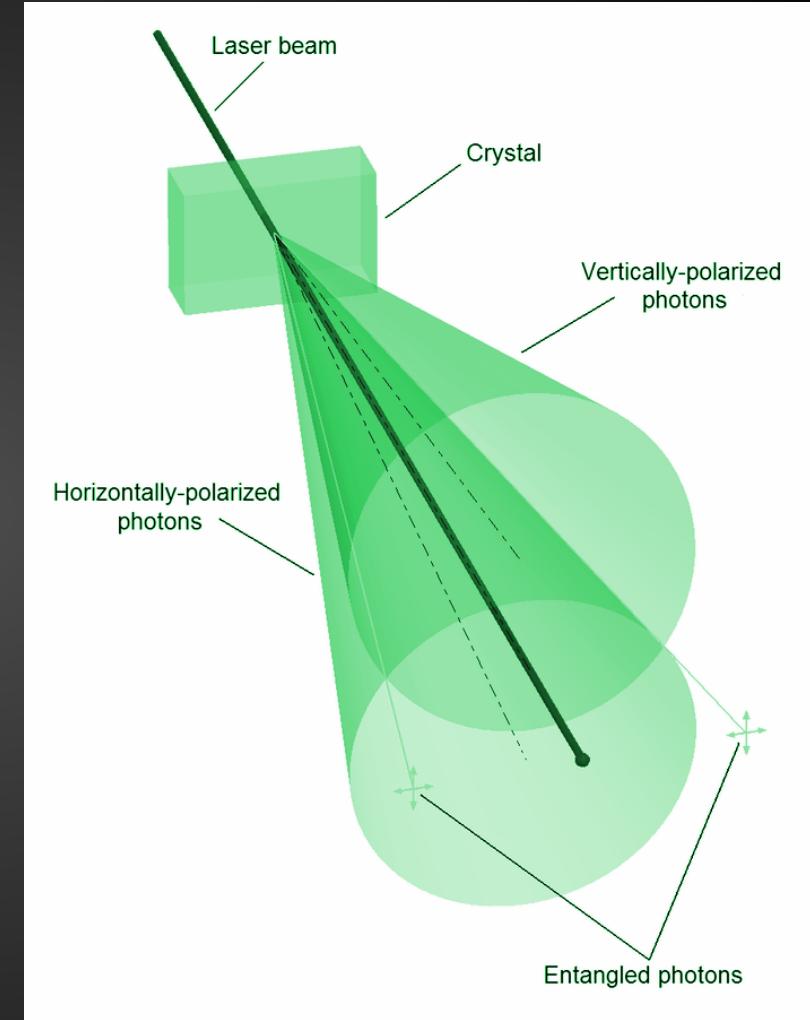
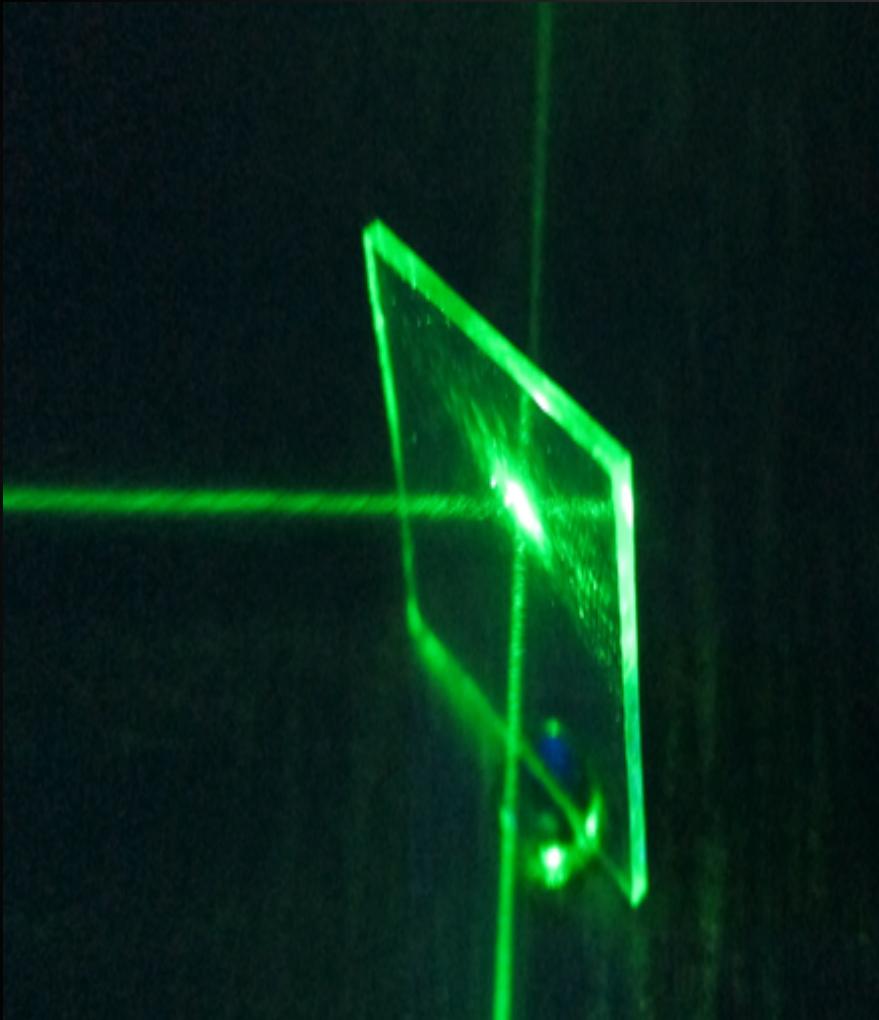


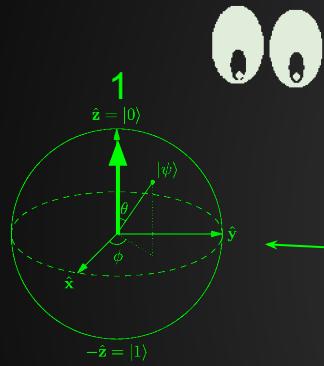




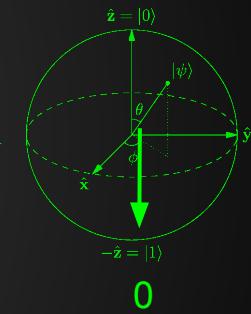






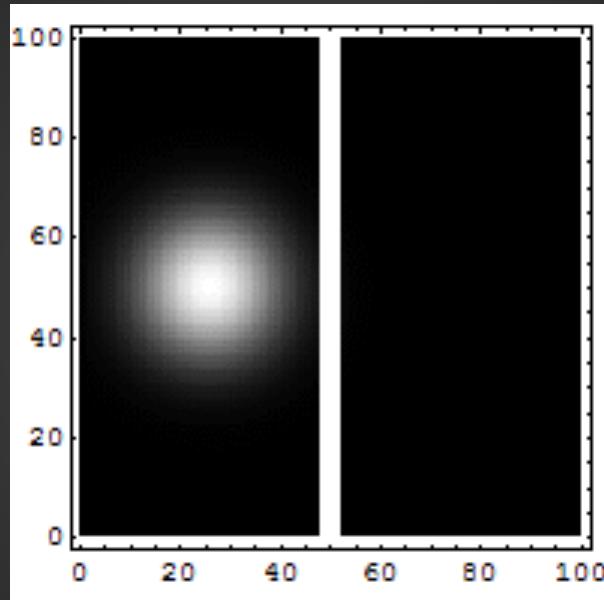


444644835000000000000000 kilometers





quantum tunnelling





314606891

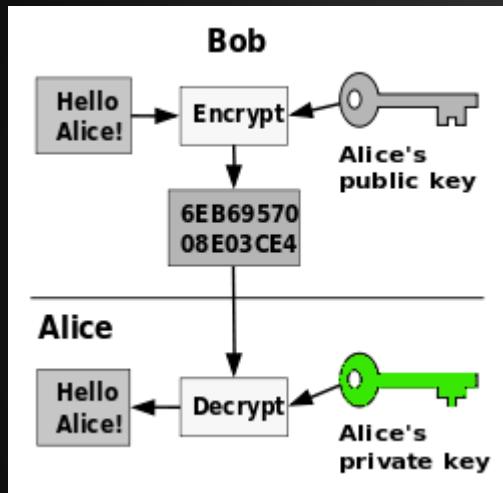
x

899809343

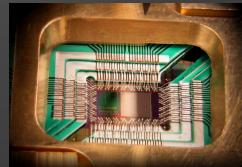
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283086219893982613

500 bit key

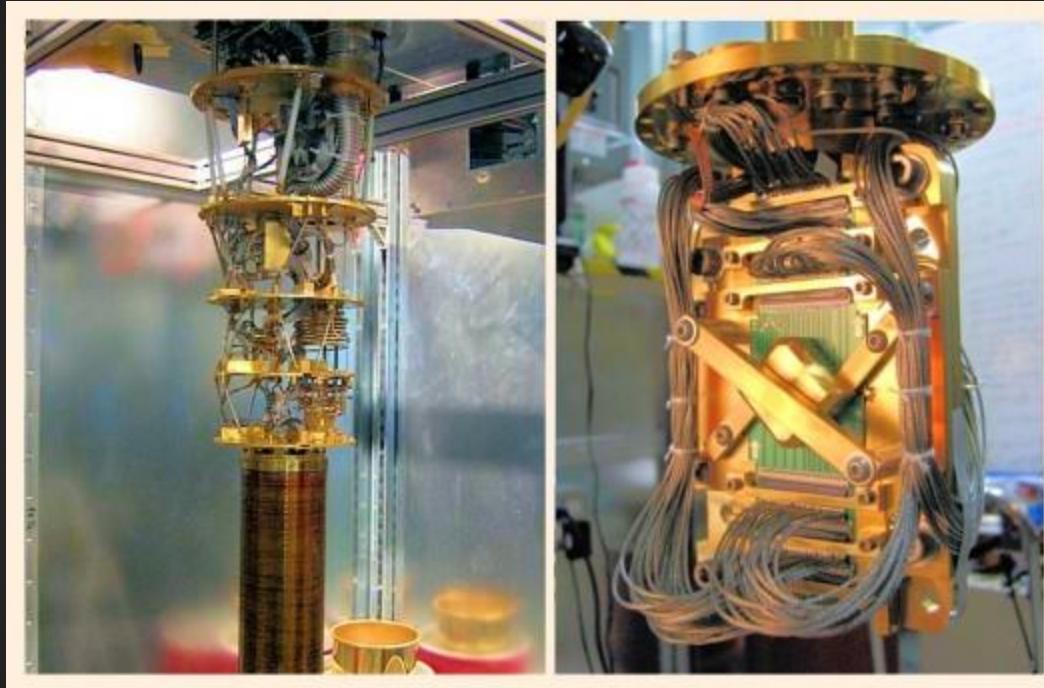


= 10000000000000000000 years



= 2 seconds

quantum annealer ( find global minimum )



shor's algorithm ( prime factors in polynomial time )



100 billion neurons

300 qubits = all the atoms in the known universe

