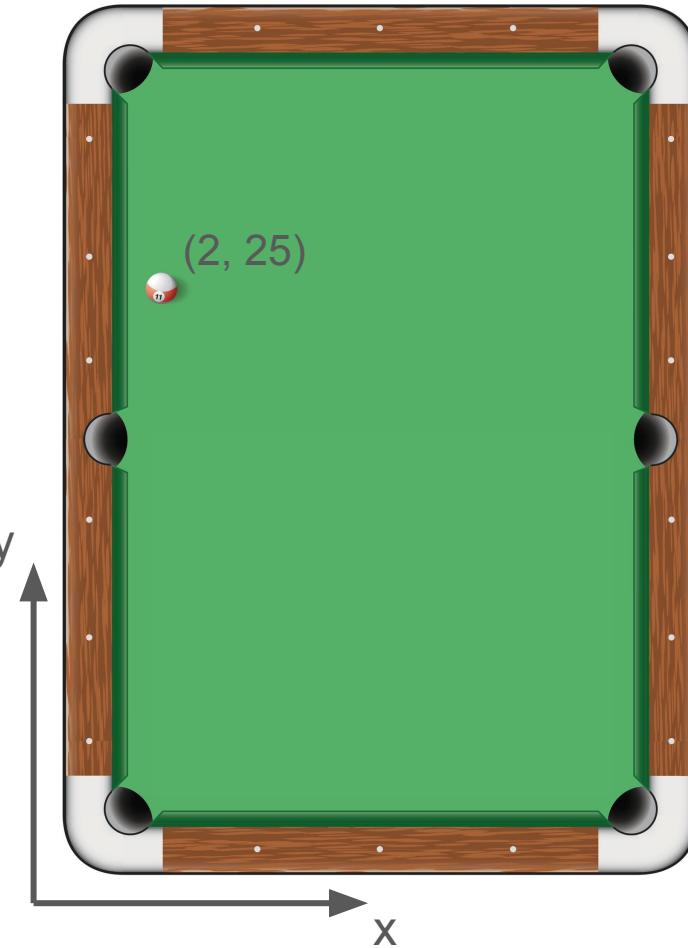


```
/*c128*/case 3: {c(Vd)a=Rd(p,0),b=Rd(p,1);r=unpack_Vz(a,b);break;}  
/*c64*/case 4: r=unpack_Vf(Rf(p,0));break;  
/*c32*/default: r=Z2(Zd,Zd);break;  
};r),c(i32)t,c(void)*p)  
  
compensatedPlus :: Num a => a -> a -> a -> (# a, a #)  
compensatedPlus t c de = (# t', c' #)  
where de' = de + c; t' = t + de'; c' = de' - (t' - t)  
  
proc logDebug(msg...) {  
try! stderr.writeln(  
"["Debug] [" , here, "] ", (...msg)); }  
  
Applications of novel  
programming languages and  
compilation techniques to  
accelerating quantum  
many-body science  
  
Tom Westerhout
```

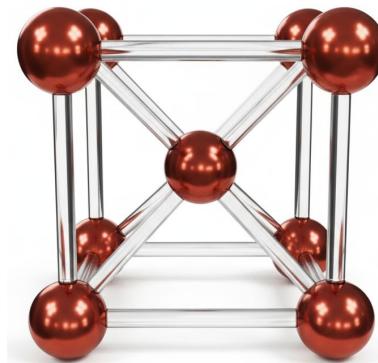
# Classical mechanics



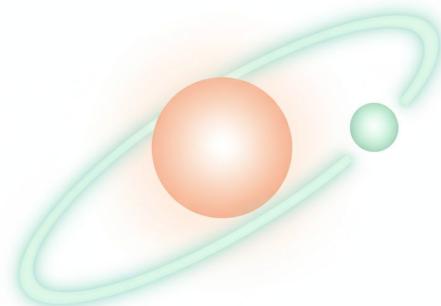
# Quantum



Stainless steel pan

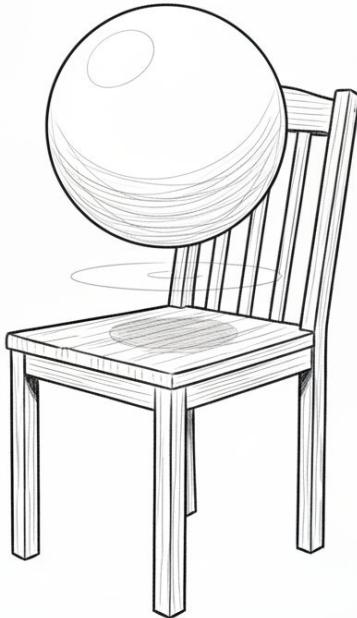


Iron atoms

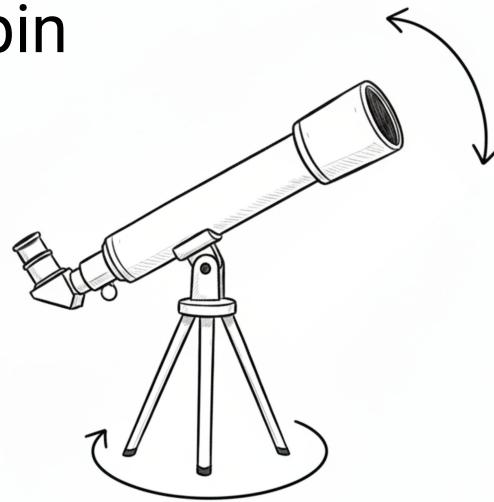


Hydrogen atom

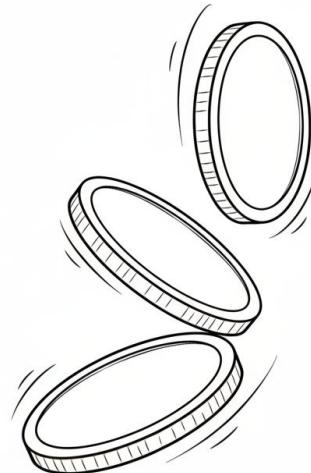
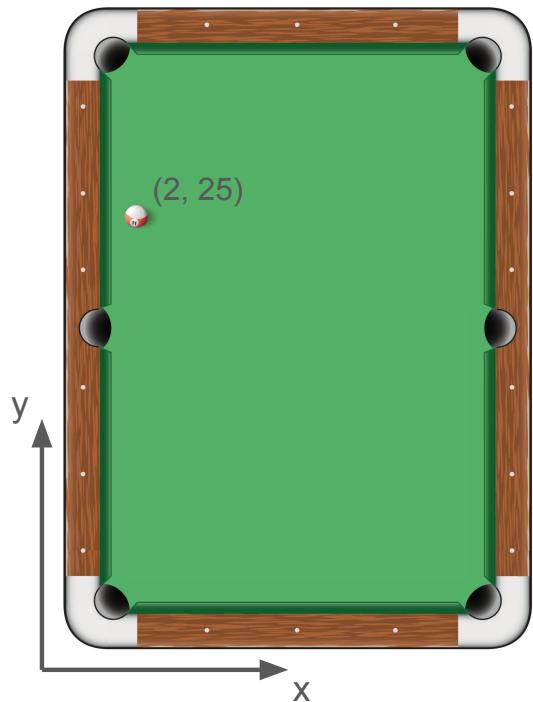
# Electron



# Spin

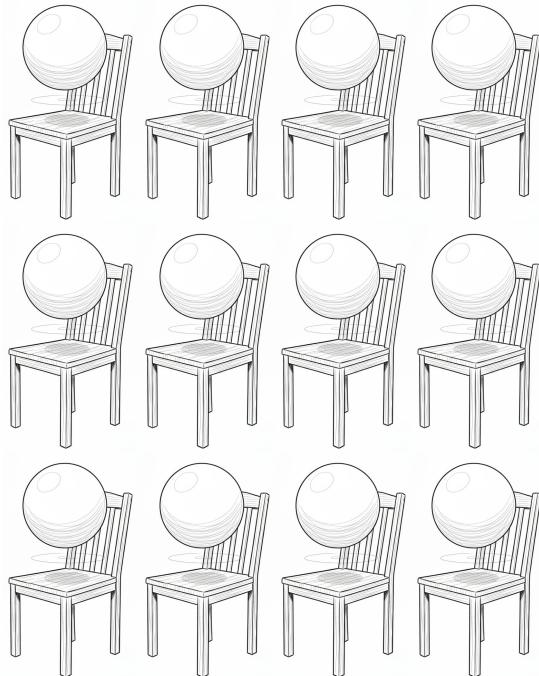


2 angles



Heads or tails

Probability of heads & tails



↓↓  
↓↑  
↑↓  
↑↑

4

↓↓↓  
↓↓↑  
↓↑↓  
↓↑↑

8

↓↓↓↓  
↓↓↓↑  
↓↓↑↓  
↓↓↑↑

...

16

↓↑↓↓  
↓↑↓↑  
↓↑↑↓  
↓↑↑↑

...

4096

Classical



+2

2, 4, 6, 8, 10, 12, 14, ...

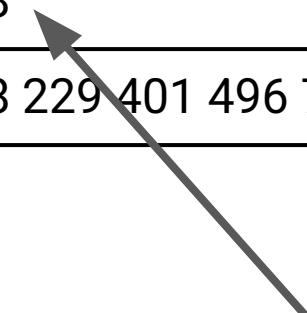
Quantum



×2

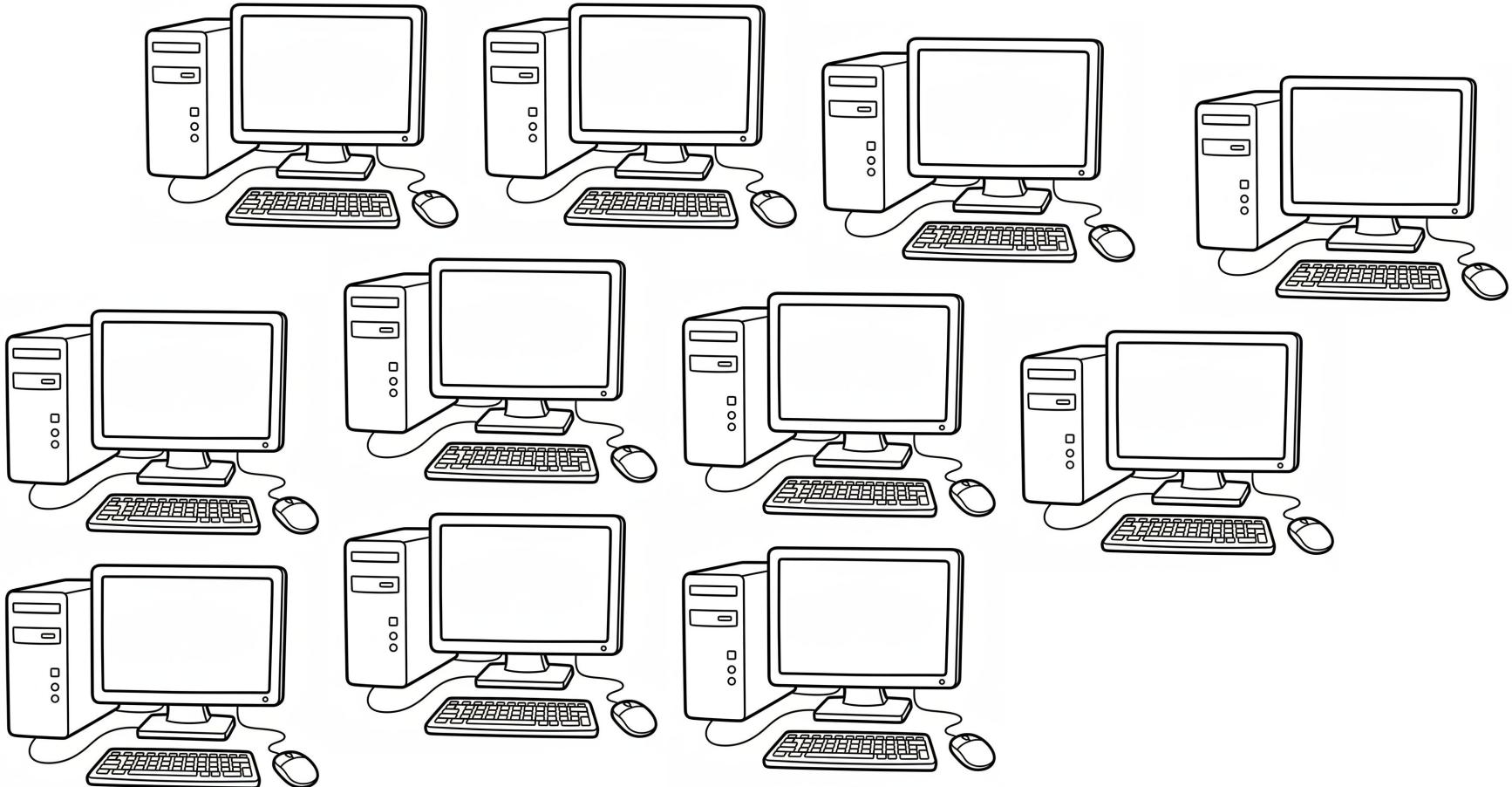
2, 4, 8, 16, 32, 64, 128, ...

Pool balls / Spins	Classical	Quantum
1	2	2
5	10	32
20	40	1 048 576
43	86	8 796 093 022 208
100	200	1 267 650 600 228 229 401 496 703 205 376



ChatGPT  
/ Gemini  
/ Claude

# High performance computing



"Computer<sup>100</sup>  
Science,<sup>101</sup> + Physics = "My PhD  
<sup>10</sup>  
<sup>101</sup>  
11010