

# THE MODAL INTERPRETATION OF QUANTUM THEORY

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# Main claim

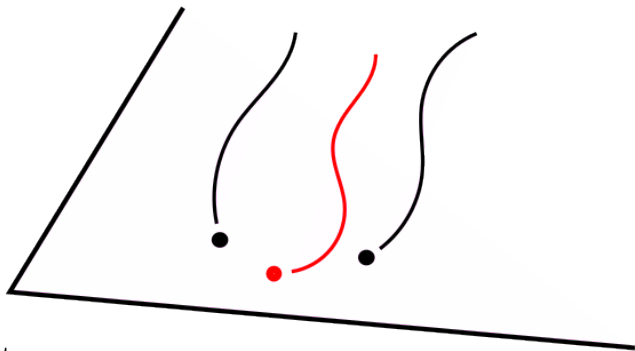
The possibility structure is fixed in classical physics but changes with time in the modal interpretation of quantum theory

- Physical magnitude
- State
- Dynamics

- **Classical physics:** Value state = Dynamical state
- **Quantum theory:** Value state  $\neq$  Dynamical state

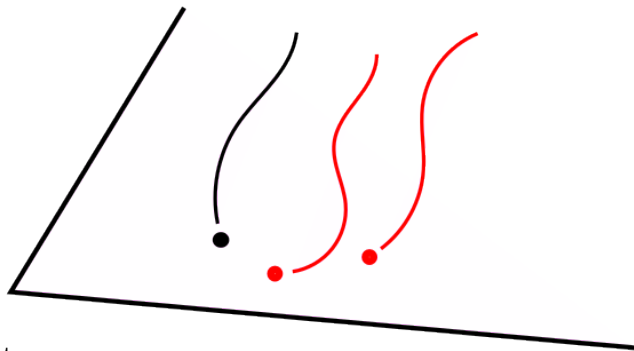
- ① **Algebraic possibility:** event in a probability space  
(before fixing the actual state)
- ② **Probabilistic possibility:** event which is assigned  
non-extremal probability by the actual state  
(after fixing the actual state)

# Classical physics



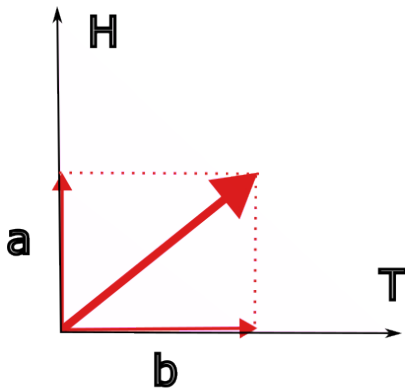
State space

# Classical physics



State space

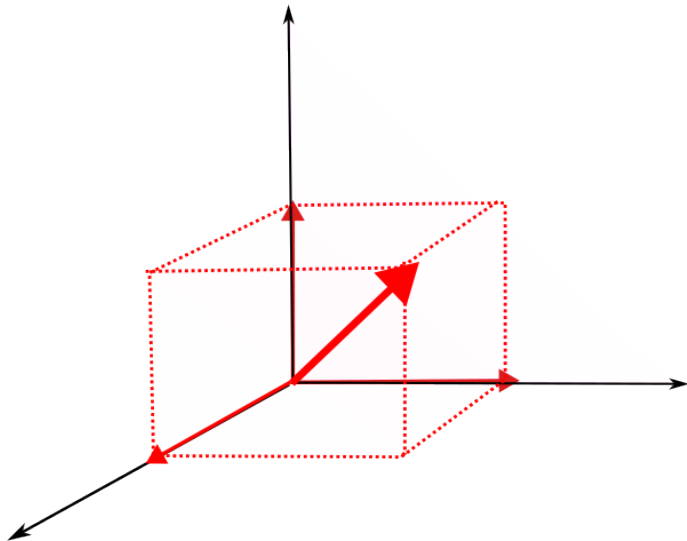
## Pythagorean theorem



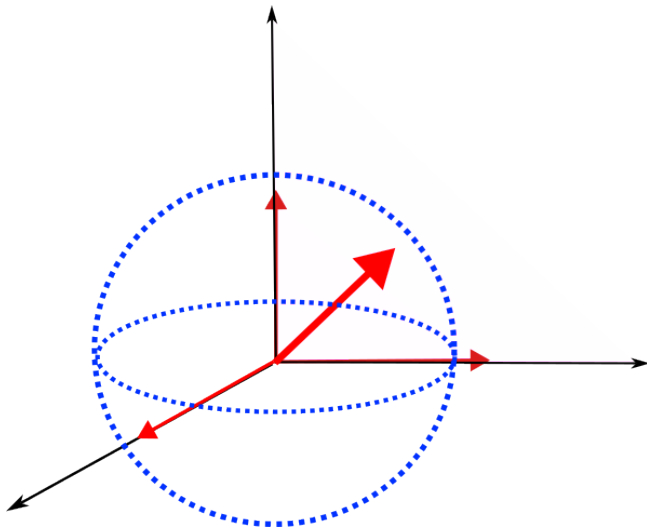
$$a^2 + b^2 = 1$$



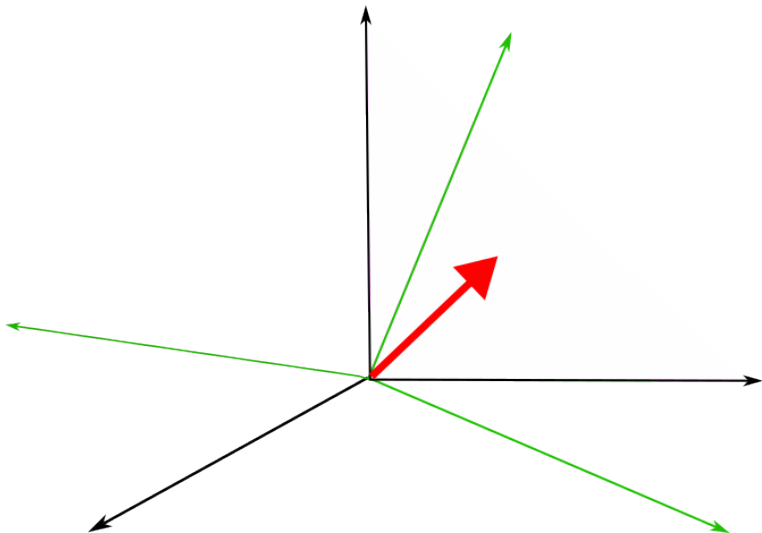
## Pythagorean theorem in 3D



## Dynamics

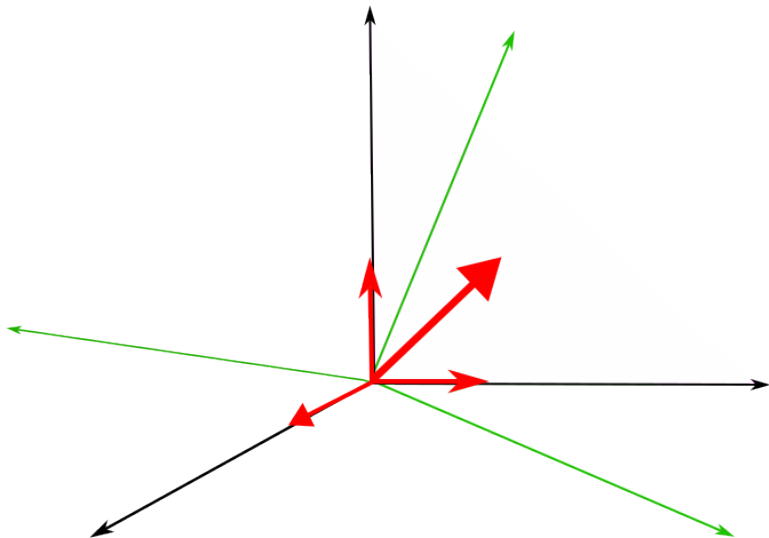


## More events

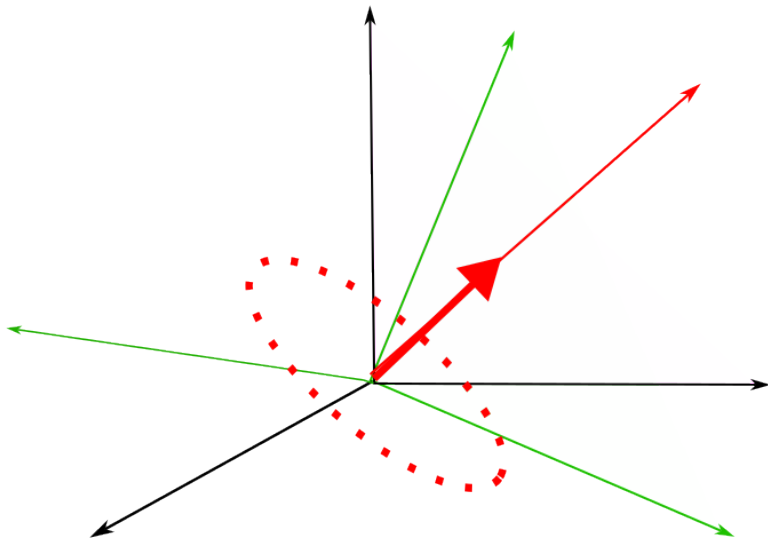


**Possibilities:** largest (non-Boolean) set of events to which probability can be assigned

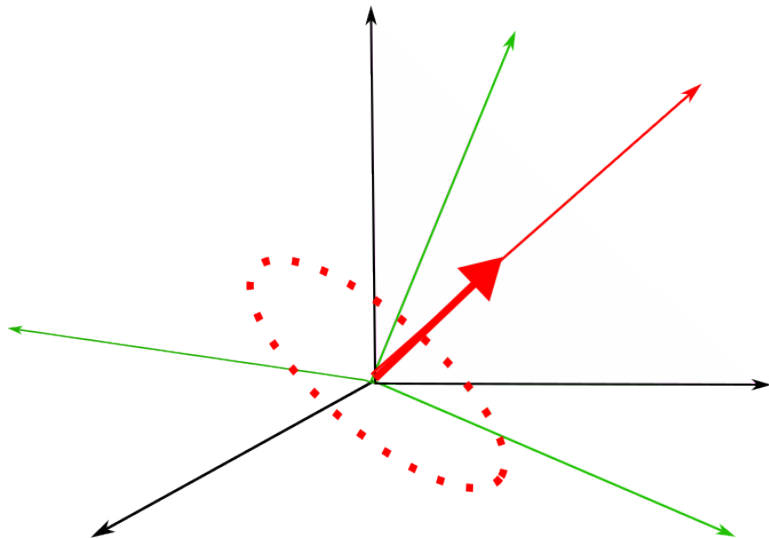
## Fixed possibilities



## Possibilities changing with the dynamical state



## Non-classical event space



## Perspectivalism (Wigner's friend):

- $S + F$
- $(S + F) + W$

composite system



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# References

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