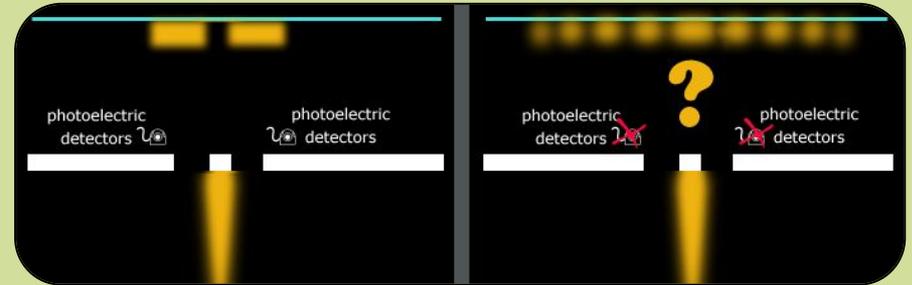
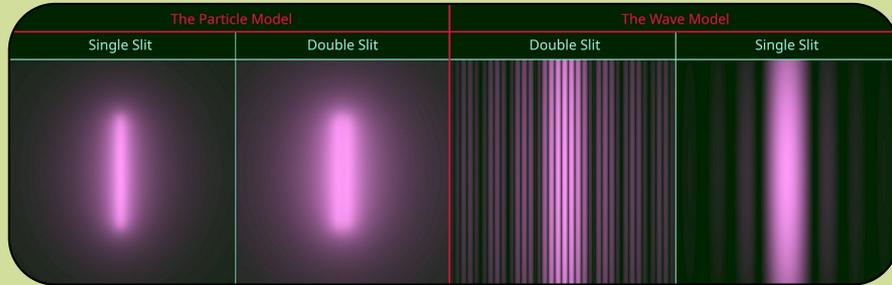


Aethic Reasoning

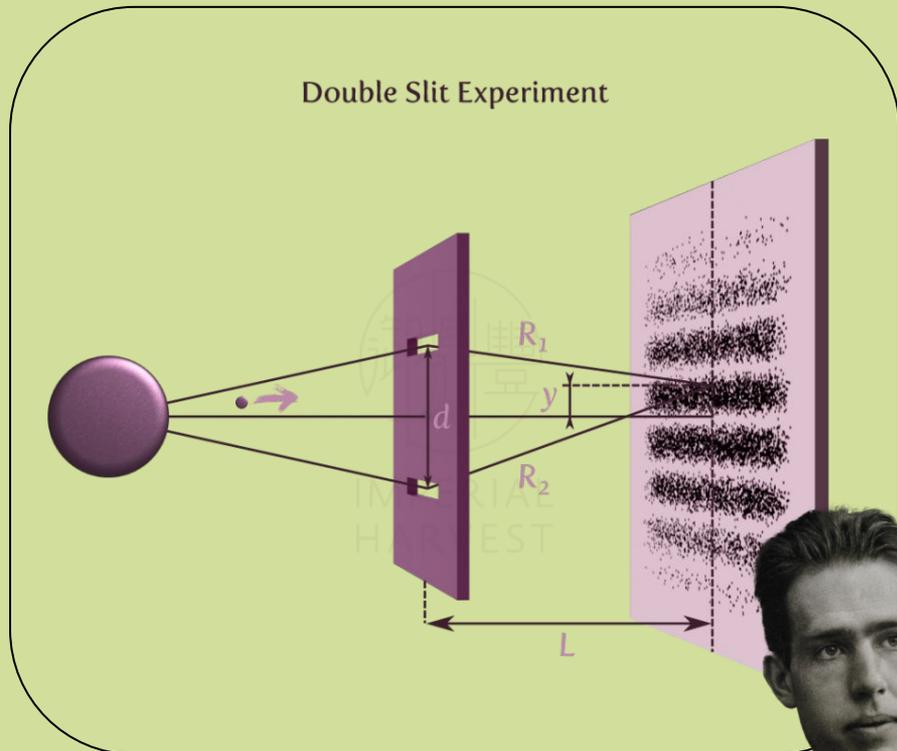
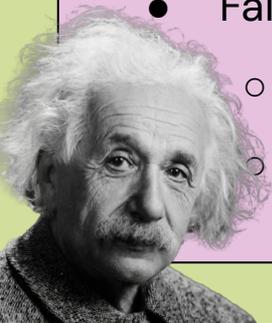
Addressing the Quantum Observer Effect With Inductive Reasoning



Presented By: Ajax

What is Aethic Reasoning?

- I came up with Aethic reasoning in 2022-2023
- An attempt to explain the quantum observer effect
 - w/ simplest possible inductive reasoning
- Fair warning:
 - *Reality is about to get weird*
 - That's the fun of inductive reasoning, anyhow!



SECTIONS OF DERIVATION

1

Introduction to Aethic Structure

2

Aethic Extrusion Principle

3

Aethic Union Principle

4

Aethic Inheritance + *Miscellaneous*

5

Double-Slit Experiment Intro

6

Deriving the Third Postulate

7

Solving the Quantum Observer Effect

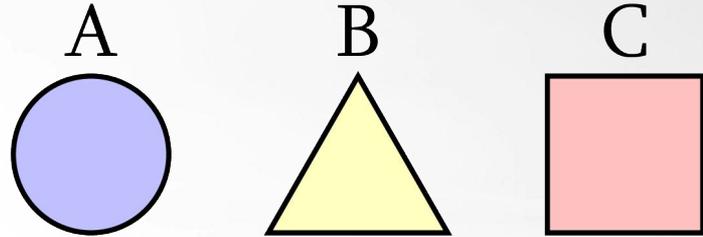
The Aethic structure

Definition of an Aethus

“An equivalence class of lists of properties (describing part of a system) which can be derived from one another.”

- Motivation:
 - Moving closer to the ontological system than just the list alone
 - Not really the system itself
 - Just (arguably) our closest shot using mathematical Platonic ideals
- Vocab:
 - *State*
 - *Attribute*
 - *Stated-Attribute*
 - *Static Aethus*
 - *Aethus*

Aethic Structure



List of Attributes

- A is a circle.
- B is a triangle.
- C is a square.

Alternative List

➤ If A is a circle then B is a triangle and C is a square.
➤ A is a circle.

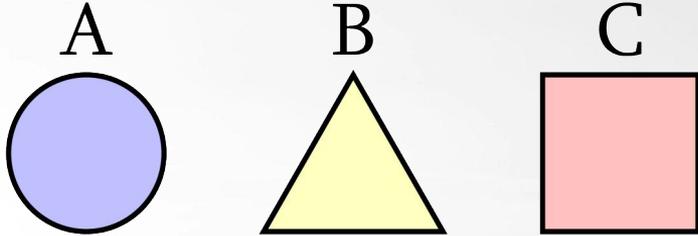
Alternative List

➤ Either A xor B is a circle.
➤ Either A xor B is a triangle.
➤ A is a circle.
➤ C is a square.

Aethus

ALL POSSIBLE LISTS TOGETHER

Aethic lists as mappings

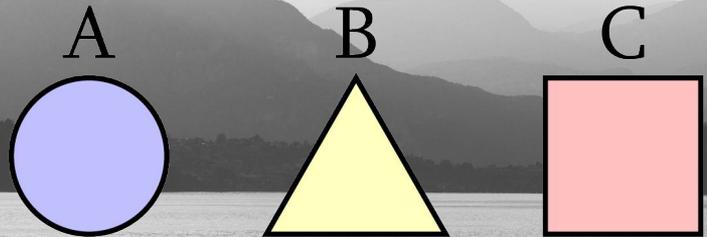


List of Attributes

- A is a circle.
 - *true*
- B is a triangle.
 - *true*
- C is a square.
 - *true*

Alternative List of Attributes

- A is a circle.
 - *true*
- B is *not* a triangle.
 - *false*
- What shape is C?
 - *Square*



Aethic Structure

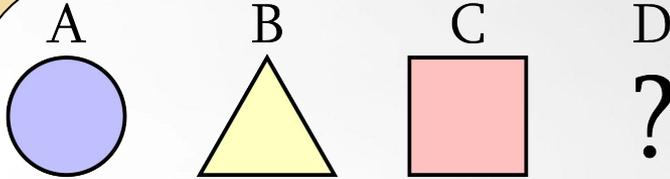
The blank state & Aethic retrievals

What about unknown information?

Unknowns assigned the "blank state"

Blank attributes store the blank state...

But they are always retrieved as all possibilities



List of Attributes

- A is a circle.
 - true
- B is a triangle.
 - true
- C is a square.
 - true
- What shape is D?
 - *blank

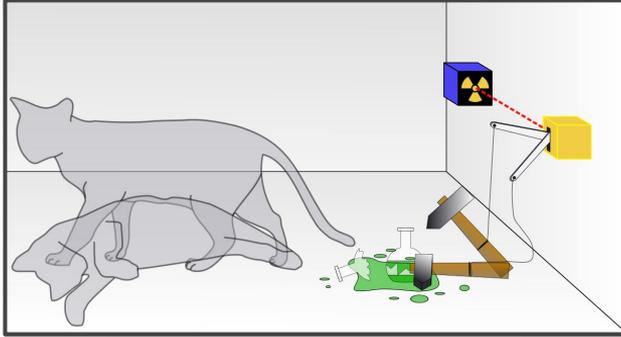
Aethic Retrievals

1.If Known
*Query attribute
(lookup)*

1.If Unknown
*Return all attribute states
(2nd postulate)*

1.Else
*Return only possible states
(Aethic dichotomy theorem)*

Intuitive application of blank attributes



List of Attributes

- Schrödinger's cat is in the box.
 - *true*
- Schrödinger's cat is alive.
 - **blank*

Sidenote:

Don't encode "did I look in the box" into the Aethus directly – just put the cat's state in as blank.

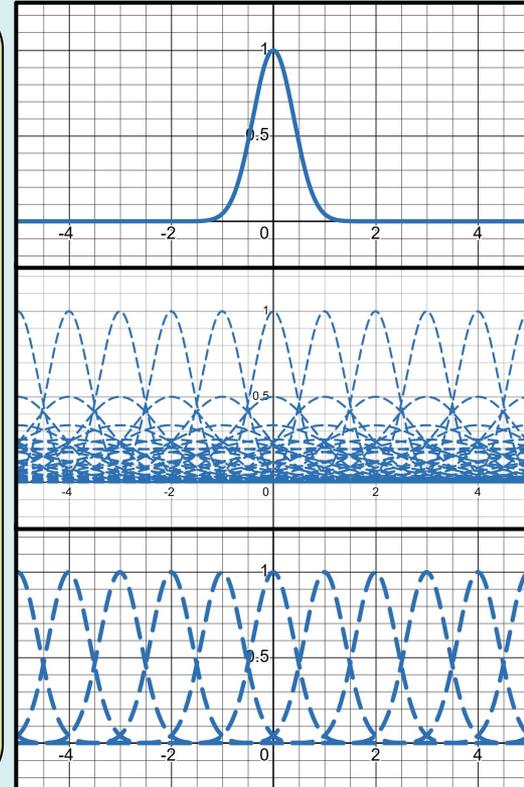
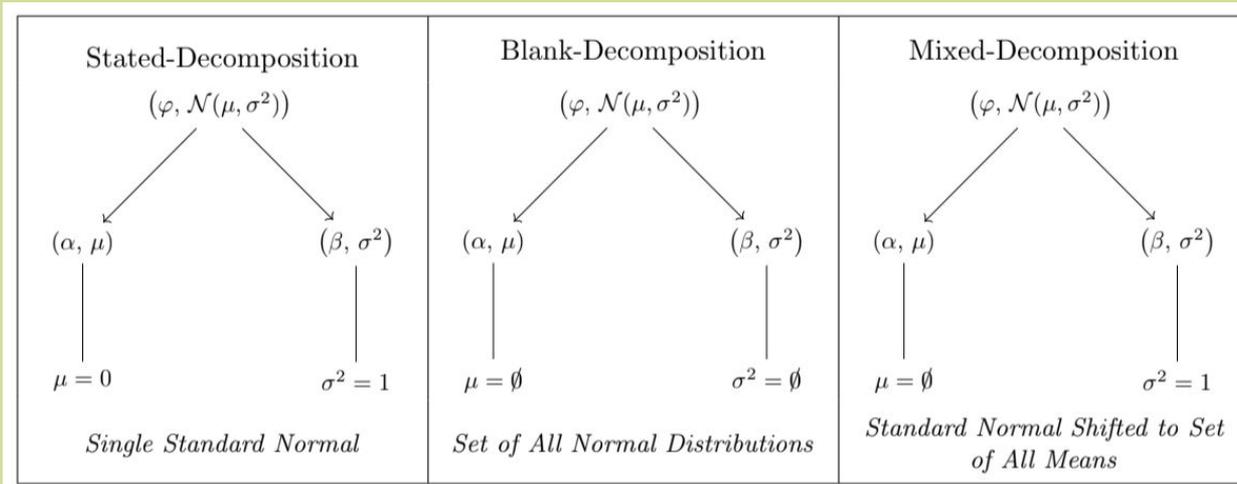
You can still retrieve that question, just don't hard code it!

The Aethic dichotomy theorem

Aethic Structure

Retrieval term:

“Retrieve the described normal distribution from this Aethus.”





Aethic Structure

Invalid Aethae

- Super important!
 - Certain examples of Aethae need to be *INVALID!*
- Classic example (contradiction):
 - *A* is a circle.
 - *A* is *not* a circle.
- Aethic contradictions \neq Aethic superpositions
 - Contradictions are *interior*
 - Aethic superpositions happen in *retrieval*
- (Invalid Aethae give us “Platonic objectivism–proofing”)

Now for some actual ontology ...



Extrusion Principle

Extrusion Principle



Where is “possibility ” stored?

- Textbook answer:
 - **“Possibilities are stored in the future timelines which haven’t yet branched”**
 - This answer is as old as humans are
- The Aethic answer:
 - **“Possibilities are stored in all the retrievals to your Aethus”**
 - This is the *Aethic extrusion principle*

Extrusion Principle

Schrödinger's cat & Aethic extrusion

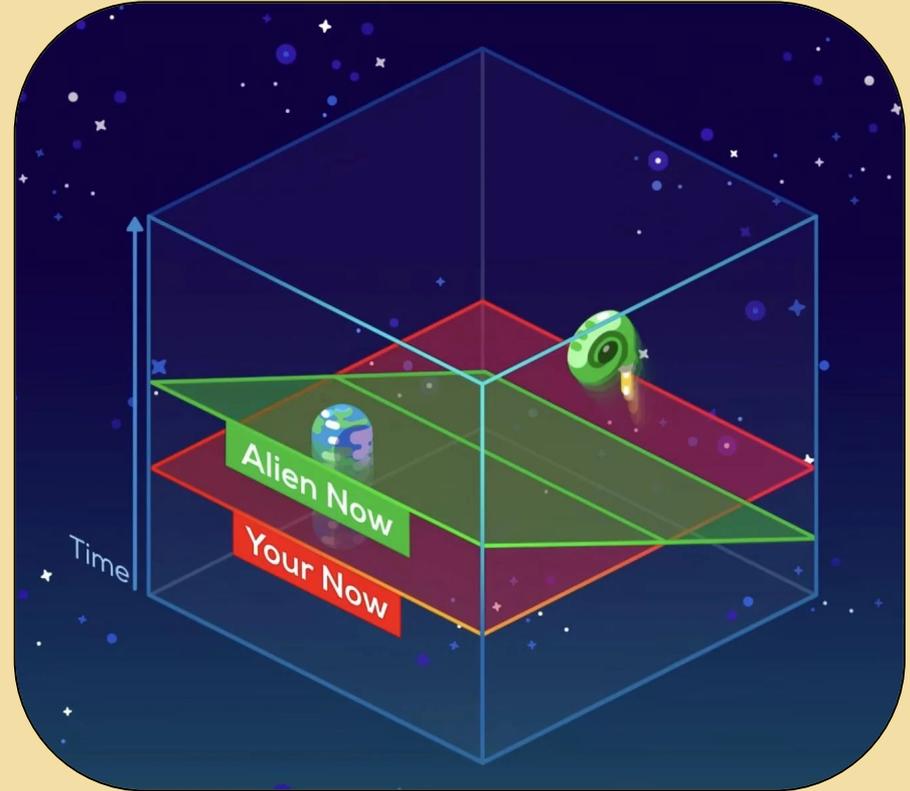
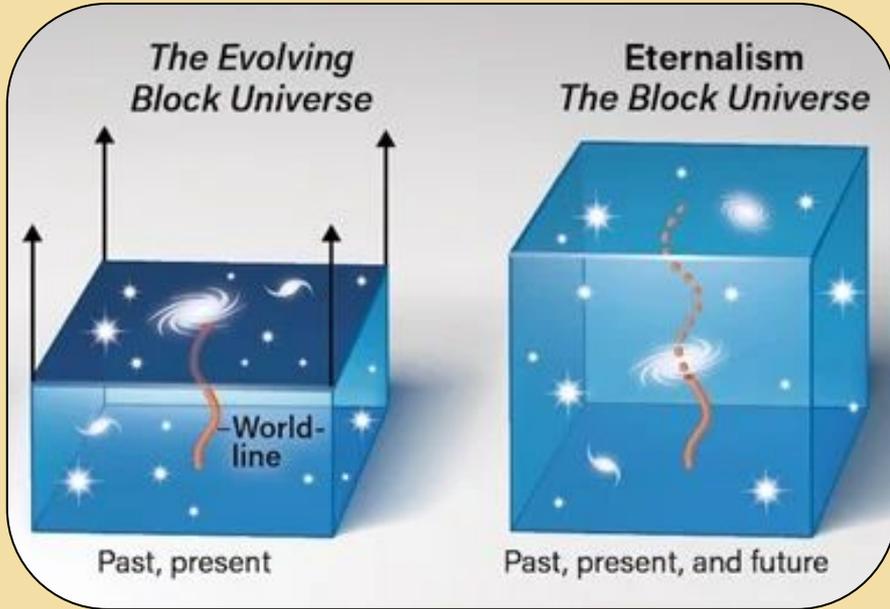
- Collapse as Aethic update
- We only see diagonals
- We can infer the existence of the cross diagonals
- Result is several block universes
- Analogy of driving past different trees

	Prior Time	Subsequent Time
Prior Aethus	$\frac{1}{\sqrt{2}} \text{cat}\rangle + \frac{1}{\sqrt{2}} \text{dead}\rangle$	$\frac{1}{\sqrt{2}} \text{cat}\rangle + \frac{1}{\sqrt{2}} \text{dead}\rangle$
Subsequent Aethus	$ \text{cat}\rangle$	$ \text{cat}\rangle$

An arrow points from the top-right cell to the bottom-right cell, indicating a transition or collapse.

Extrusion Principle

Block universe visualization



1st Postulate of the
Aethus

Reality is relative

- Because of the extrusion principle...
 - Reality has to be defined relative to an Aethus
 - That way Aethae can disagree on possibilities and both be right!
 - We get the first postulate of the Aethus

First Postulate of the Aethus

Any attribution of realism is a statement of relation to a particular Aethus.



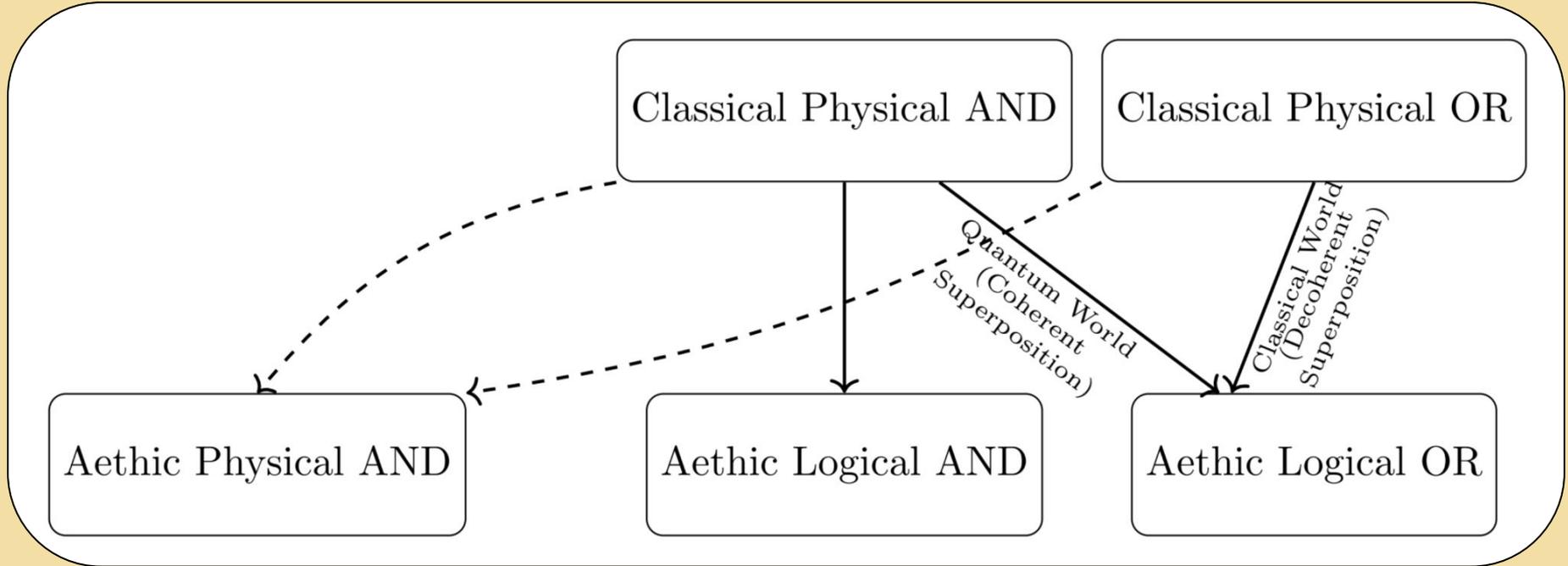
Aethic Union Principle

Intro to the Aethic union principle

- Line up Aethic unions with event unions
- Line up Aethic intersections with event intersections
- Caveat with sets – but whatever!
- Now unions and intersections line up with retrievals – not attributes!
 - Unions always subtract Aethic attributes – intersections add them
- But how do we model quantum superpositions?
 - Have to be unions because Aethic structure
 - But then where does “and” versus “or” go?

Aethic Union Principle

Aethic union principle reshuffle chart



- Classical Physical → Aethic Physical vs. Aethic Logical

Aethic Union Principle

Both cases count as
"A and B occur at
once"

Therefore... we have
TONS of new
degrees of freedom!

(Caveat: uses
retrieval unions and
intersections rather
than more general
Aethic unions and
intersections)

What does *this* mean?

Agreeing Superposition

$$A \cup B$$

Disagreeing Superposition

$$(A \cap \neg B) \cup (\neg A \cap B)$$

2nd Postulate of the Aethus

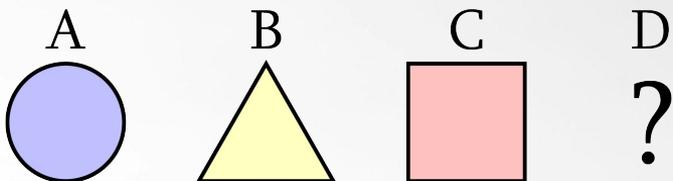
Sidenote on the 2nd postulate!

- We touched on it before...
- But here's the second postulate
 - Ontological connotations and all!
- This is where stuff gets decidedly *weird*
 - 2nd postulate + extrusion principle = *all possible unknowns share your space with you, but are unobservable*
- *This postulate is the central heart of Aethic reasoning*
 - The idea is that Aethic structures, no matter how complex, follow from this simple inductive rule
 - If Aethic reasoning = Newtonian gravity, then 2nd postulate = gravitational force

Second Postulate of the Aethus

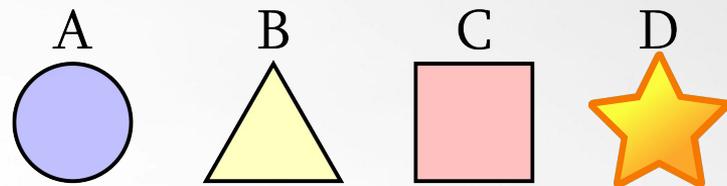
If an Aethus is valid, then any given attribute will be in Aethic superposition relative to it if and only if it is nonpresent to it.

Generating a child Aethus



List of Attributes

- A is a circle.
 - *true*
- B is a triangle.
 - *true*
- C is a square.
 - *true*
- What shape is D?
 - **blank*



List of Attributes

- A is a circle.
 - *true*
- B is a triangle.
 - *true*
- C is a square.
 - *true*
- What shape is D?
 - *Star*

Child & Parent Aethus



- Add attribute to Aethus' list → generates a "child" Aethus
- Parent Aethus is the reverse
 - I.e. If B is child to A ...
 - ...then A is parent to B
- More technical definition:
 - B is the child of A iff B can be written $A \cap C$
 - A is the parent of B iff A can be written $B \cup C$

Miscellaneous

Probability in Aethic reasoning

Aethic set-extension

What if we only add an attribute by 50%?

Old version:

$$A + 0 \cdot \text{★}$$



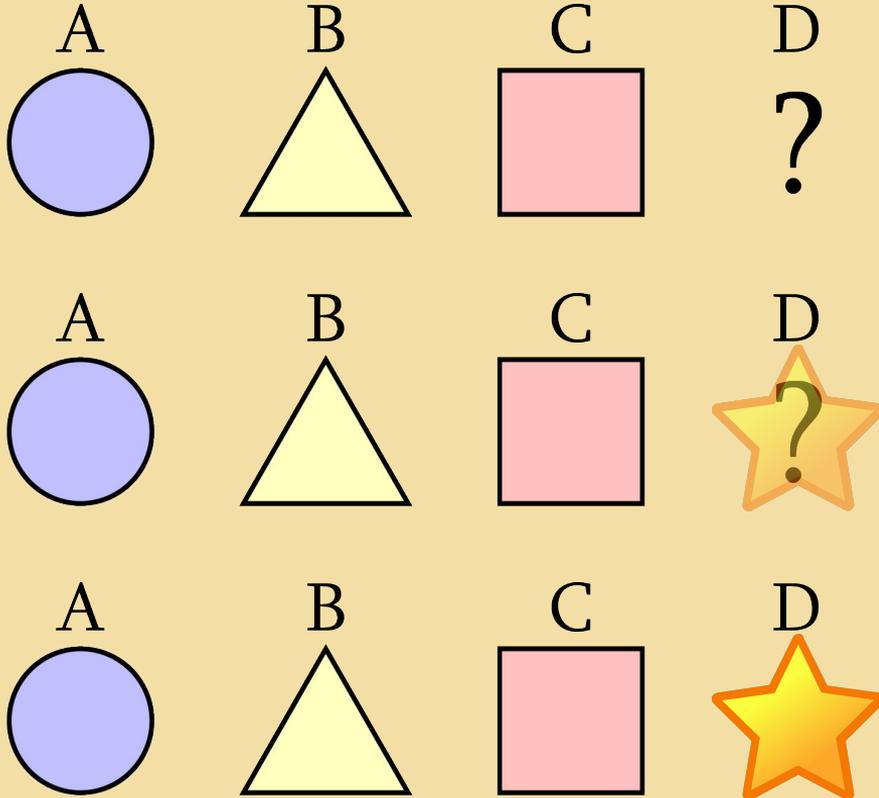
$$A + 1 \cdot \text{★}$$

New version:

$$A + 0 \cdot \text{★}$$



$$A + \alpha \cdot \text{★}$$



Probability is that “ α ”

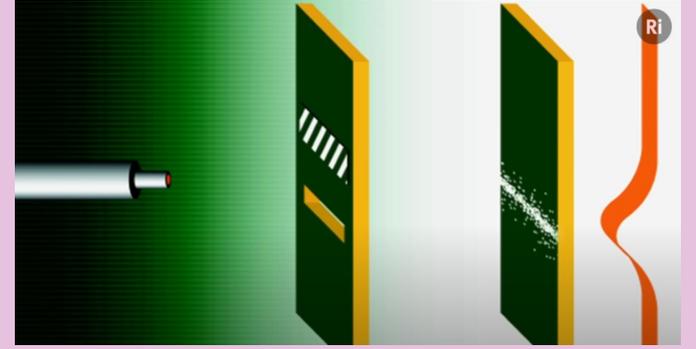
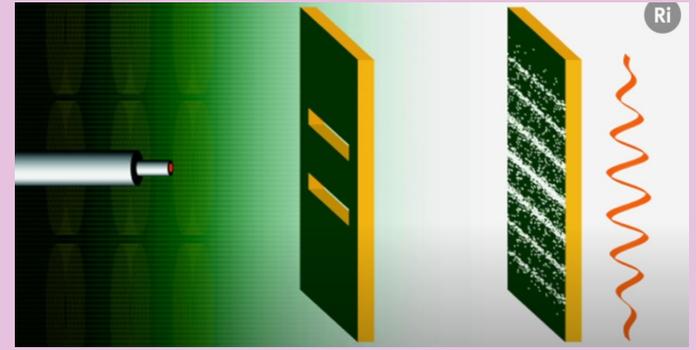
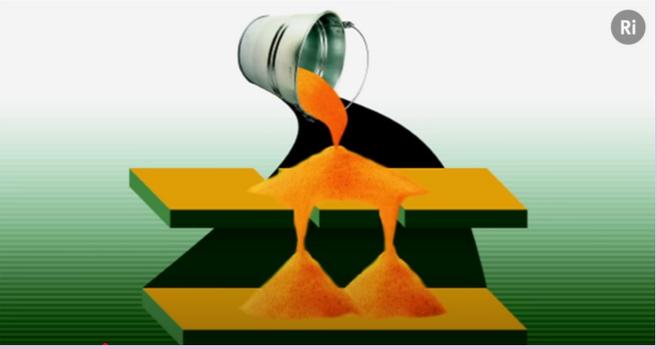
This is what we call the “Aethic weight” of the attribute

Def of probability in Aethic reasoning

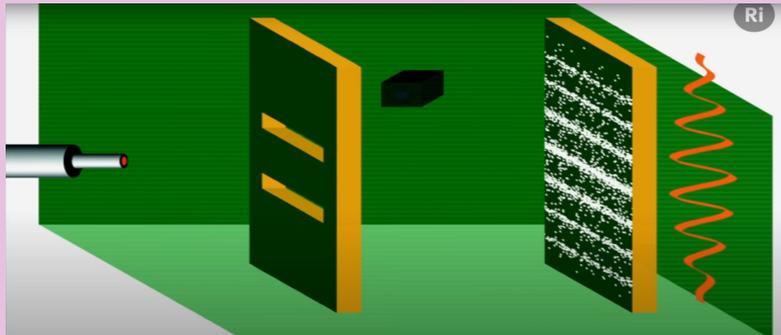
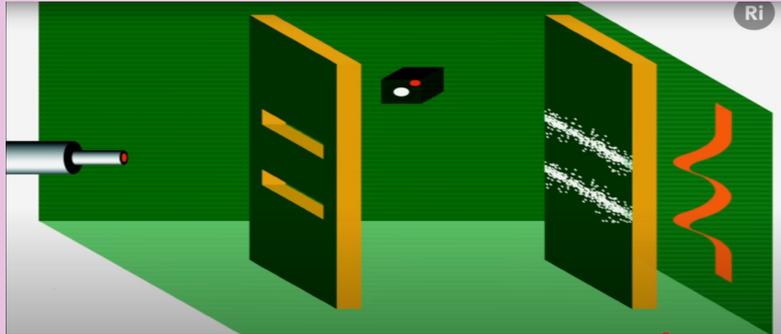
**so long as all states sum to one*

Can always be fully added later (i.e. another child Aethus)

Onto the double-slit experiment



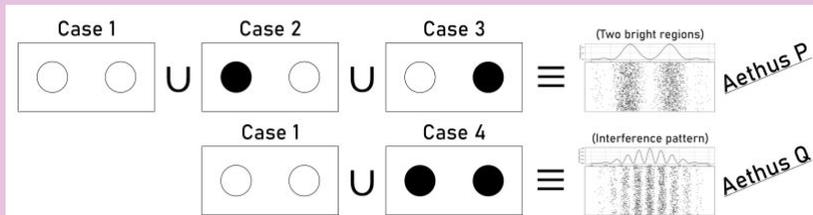
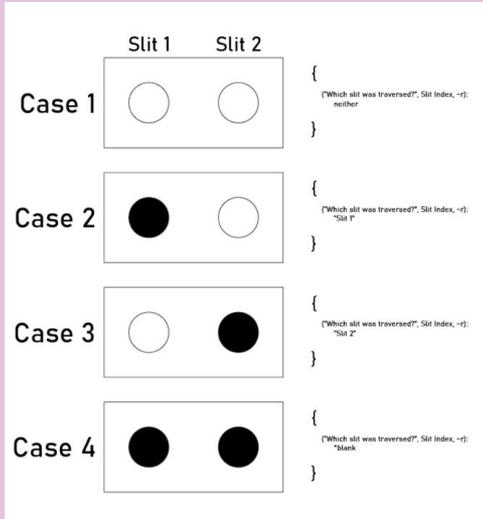
Including a detector?



This is the classic example of the observer effect!

Third Postulate

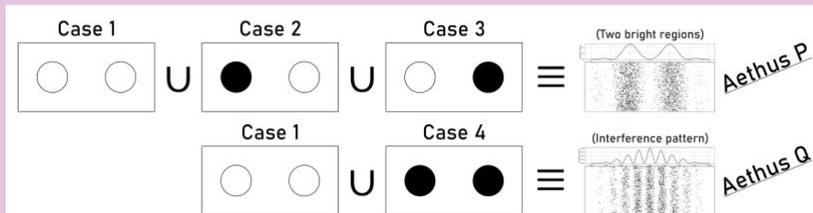
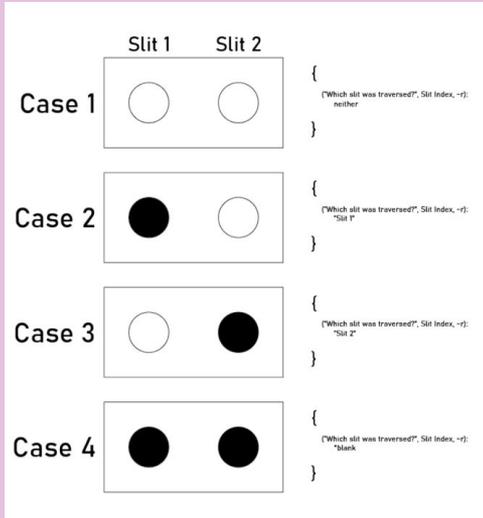
Case analysis of outcomes



- Split outcomes into cases
 - Inner: *traversed slit*
 - Outer: *case config*
- Applying the union principle
 - Disagreeing: **C2 U C3**
 - Agreeing: **C4**
- Inferred claim sidenote:
 - *Agreeing superpositions of position behave like waves*

Third Postulate

Broad steps to explanation



✓ Step Z

- 2nd postulate
- Union principle

▣ Step Y

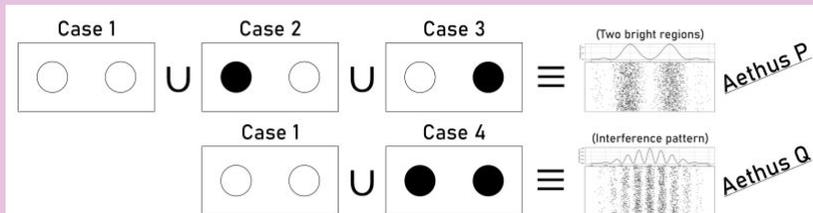
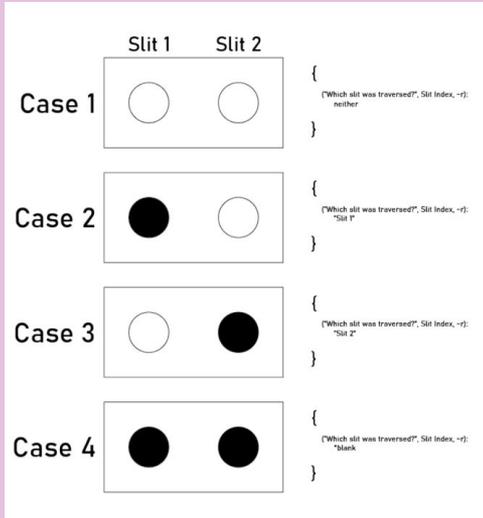
- Detect on → *Aethus P*
- Detect off → *Aethus Q*

▣ Step X

- Fit wave mechanics to Aethic foundation
- (for my follow up paper: called *active reasoning*)

Third Postulate

Good ideas vs. bad ideas here



- **DON'T**
 - Use direct mappings
 - ...because inductively weak
- **DO**
 - Use invalid Aethae!

"When the detector is running, *Aethus P* will occur."



"It is an invalid Aethus for *Aethus Q* to occur when the detector is running."

i.e.

$$a \rightarrow b \Leftrightarrow \neg(a \wedge \neg b)$$

Third Postulate

Soccer field thought experiment



- By Aethic universality...
 - *The collapse cause should be visible here*
- Invalidity of Oliver's Aethus
 - *Empirically at least*
- Issue with the extrusion principle
 - I.e. retrocausality???



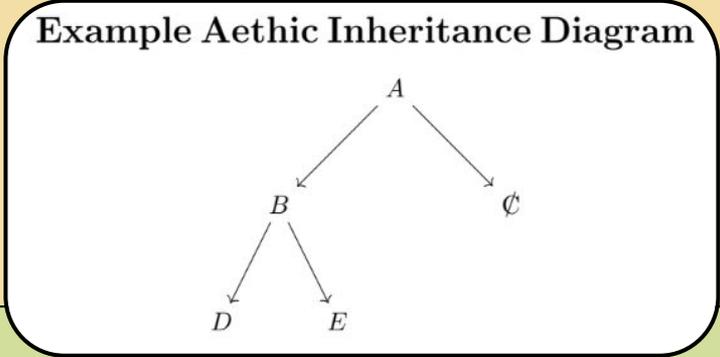
Third Postulate

Deriving the third postulate 1

- Fundamental corollary of invalid Aethae:
 - Every child of an invalid Aethus must also be invalid.

Third Postulate Attempt 1
“An Aethus will be invalid if it has any invalid proper child Aethae.”
$$\exists B \subset A, \neg V[B] \Rightarrow \neg V[A]$$

Why this can't be right...





Third Postulate

Deriving the third postulate 2

Third Postulate Attempt 1

“An Aethus will be invalid if it has any invalid proper child Aethae.”

$$\exists B \subset A, \neg V[B] \Rightarrow \neg V[A]$$

Third Postulate Attempt 2

“An Aethus will be invalid if all of its proper child Aethae are invalid.”

$$\forall B \subset A, \neg V[B] \Rightarrow \neg V[A]$$

Also a poor idea

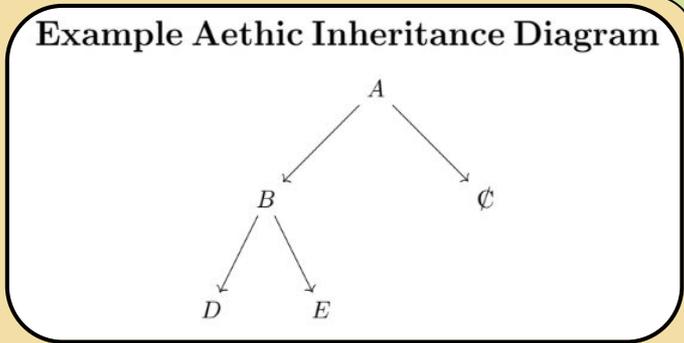
- Overly specific
- Always true, but *too strong*



Third Postulate

Deriving the third postulate 3

- For any proper child
 - Too weak
- For all proper children
 - Too strong
- Analogy with chess
 - For any \leftrightarrow **check**
 - Danger is about!
 - Force *additional attributes* \leftrightarrow **move out of check**
 - Always fails \leftrightarrow **checkmate**
 - *THIS IS THE THIRD POSTULATE*



3rd Postulate of the
Aethus

Completed 3rd postulate!

- What's cool about this:
 - *It's two-generational!*
 - Richer than just decoherence!
 - Rooted in invalid Aethae for flexibility!

Third Postulate of the Aethus

If some Aethus is valid, then there exists a proper child Aethus to it for which every one of its own proper child Aethae are valid.

$$\mathbf{V}[A] \Rightarrow \exists B \subset A, \forall C \subset B, \mathbf{V}[C] \quad (26)$$

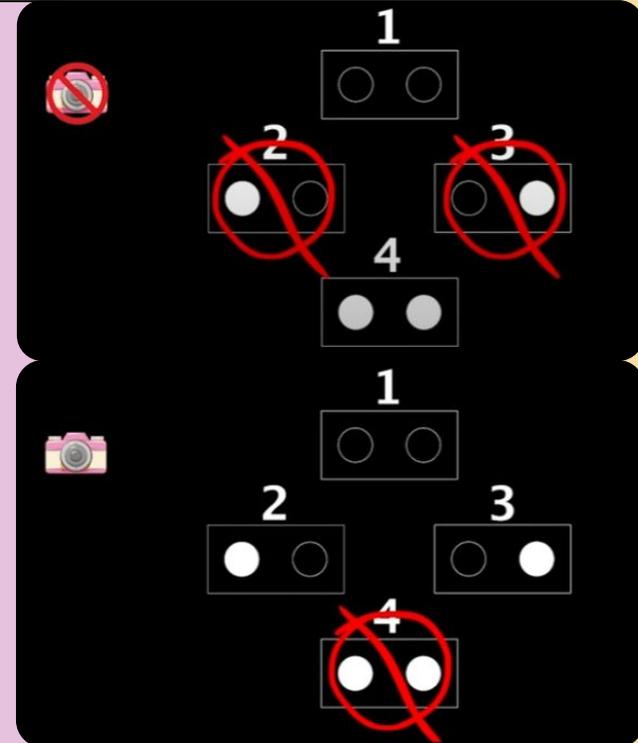
The solution!

	Case 1	Case 2	Case 3	Case 4
Detector Running	Valid	Valid	Valid	<i>Invalid</i>
Detector Absent	Valid	<i>Invalid</i>	<i>Invalid</i>	Valid

- **Detector off**
 - Use 2nd postulate directly
 - Goes through both slits (C4)
 - Automatic agreeing superposition
 - ...or doesn't make it through! (C1)
- **Detector on**
 - 3rd postulate *invalidates C4*
 - Now use 2nd postulate over remaining cases
 - Iterative power of 2nd postulate!

Therefore...

Aethic reasoning gives DIRECT theoretical derivation!





THANKS FOR WATCHING!



Source Paper Citation: A. Benander, "Aethic reasoning: A comprehensive solution to the quantum measurement problem," 2024.