#flo #inclass

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1 | quantum l1

he's doing KBxSystemsofSystemsinNatureandDeepLearning#category theory! should ask about it.

instead of fields, we look to the information they carry

this paradigm shift resolved this paradox recently

all quantum properties are described with qubits

elementary particles have no spatial extent - if they did, they would be made up of something - unlike proton! as it has some volume - wait but.. how do we make other things up? #question - mesh of particles w/ 'space' in between?

but these elementary particles and protons still have some of the same traits/properties?

not a point, but a flow? #question huh - points in spacetime, not space?

these points have a property called **spin**

the qubit has memory?

#question what does it mean to "ask"?

asking is pathing, so we can't just measure the same thing over and over - but once we do this, it's primed! we need to get a bunch of otherwise indistinguishable particles and measure them all to get 'true' probabilities

asking `up`, is "prepared in the up state" now ask again at some angle θ. what is the prob that it will say +1 again? well, $< \sigma >= \hat{n} \cdot \hat{m}$

the quantum `or` is not commutative

but, we are gonna represent it as linalg anyways. mathematics/linear$_{\text{algebra}}$/index

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really, we are making a whole different type of logic. KBxFunctionalProgramming#booleans be damned! this works by having a qubit, which is a "q&a machine." essentially, we can measure it in a direction, and it will give us an answer (+1 or -1) the answer it gives us is probabilistic and path dependent

pattern lies at a higher level of abstraction: the **probabilities** propagate at a higher level of abstraction but only the probabilities.

1.0.1 | dealing with complex vector spaces

$z|A\rangle$ is called a ket. which = $\langle A|Z^*$, called a bra (get it?) *we can think of these as complex vectors, or the row and column vectors of a matrix.*

ket is the row vec, and bra is the column vec.

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title: this star is called a hermission operator:
```ad-def
An Hermitian operator is **the physicist's version of an object that mathematicians call a self-adjoint
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so, $\langle A|B\rangle$ yields a scalar. we can take the complex conjugate, yielding $(|B\rangle)^*(\langle A|)^*$

we can also define them as $|A\rangle = \sum_i \sigma_i |i\rangle$ and $\langle j|A\rangle = \sigma_j$

$|A\rangle = \sigma_u|u\rangle + \sigma_d|d\rangle$
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