#flo #inclass

---

1 | **Constructor theory time?**

her website

title? beyond quantum computing: the science of can and can't - technically, this is constructor theory - constructors are meant to be generalizations of the concept of a computer - really, this means she is interested in QIC, she says

> physics is about explaiing what we see in terms of the 'unseen'

hmm. idk about that. first counterexample that comes to mind is zero knowlege proofs? isnt most science about explaining the seen with fundemental overarching rules? it certainly is very strong in physics

QIC = quantum theory + computers

the goal was quantum supremacy

the 'universal constructor' is a programmable machine that can perform any task that is physically allowed

aight, looking at how physics is formulated?

- bunch of theories
    - classical
        * newtons laws
        * maxwells equations
        * genreal relativity
    - not classical
        * quantum theory
- but all of these are about describing **trajectories** in spacetime given some initial state

1.1 | **counterfactual**

important concept of the **counterfactual** - an example, - why is a checkmate impossable in a given state? - apparently, the best explanantion is with the counterfactual

and now we get to physics - a couple laws - conservation of energy says we can't make perpetual energy machines - also the 2'nd law, meaning can't convert all heat into useful work - and also heisenberg uncertainty: it's impossable to copy reliably all qubit states - these laws all constrict - so things that these laws don't constrict are possible? - constructor theory says that **the fundemantal laws are the ones which allow and don't allow, not the dynamical equations** - the dynamical equations are explained using the new fundamental "can/can't" laws

$() : 0 \rightarrow 42$