

**QuantumMary meets  
Computationalism**

–Marcin Miłkowski, Polish Academy of  
Sciences



## Plan of the talk

- Would QuantumMary be surprised?
- Is quantum information processing purely physical?
- Quantum computation vs. quantum consciousness: would QuantumMary be a quantum computer?
- Bottom line: puzzles of standard computationalism are all present in quantum accounts of consciousness, but there are even more puzzles...

## Quantum level accounts of consciousness

- In theories such as panpsychism and in quantum consciousness theories, it is being suggested that the quantum level of description is the one that could explain consciousness.
- Many theorists claim that there is a form of (proto)consciousness on the quantum level.
- So let's see this in detail...

## QuantumMary and a red quark ;)

- If there is something like quantum-level consciousness, irreducible to any other physical processes, then we can imagine...
- QuantumMary, a configuration of elementary micro-physical processes, that is supposed to know everything about colors
- But she happened to never encounter a “red quark” (or whatever)
- Someday she does: would she be surprised?

## QuantumMary: surprised or not?

- If QM is surprised, then it's hard to say why quantum processes shed any light on consciousness...

BUT

- If she's not surprised, one must follow one of the standard physicalist replies (knowledge/skill distinction, or Dennett's complete denial of the assumptions)
- A third way: deny that QM can *know* anything, and try to apply Heisenberg's principles... But that's a non-starter: we can have QM *simulate* her states just by changing them appropriately (and she must be able to do that, as there is no consciousness without conscious voluntary attention).

## QuantumMary: surprised or not?

- First horn of the dilemma:
  - Accept she's surprised
  - She simply has no access to all possible intrinsic properties of her experience prior to experiencing the “red quark”
  - However, intrinsic properties of micro-physical are supposed to explain consciousness somehow (Chalmers): now, how do they do that, if QM is surprised?
- Second horn of the dilemma:
  - She's not surprised
  - She must have access to all possible intrinsic properties of her experience
  - But why don't we? After all, we seem to be smarter?

## QuantumMary and computationalism

- If we accept Feynman's argument that there could be quantum computers (FA):
  - If there is a physical process that seems to process information, we can use it for effective computation
- ... then QuantumMary is a computational system, as she does process information, at least phenomenal information.
- But QuantumMary is just like Dennett's RoboMary – she's functionally specifiable, as according to (FA) we can treat 'intrinsic' (if any) qualities of her experience as being processed (non-standardly) in a computational way
- QM and RM realize consciousness in a computational way: is the supposed 'hypercomputational' quantum power that makes quantum level explanations somehow better?

## QuantumMary vs. computationalism

- So there are two things a quantophile can do:
  - Deny (FA) and say that quantum computation is a bogus notion
    - OR
  - Accept that QM is computational.
- But in the first case, you must discard all research on quantum computation as bogus
- And in the second case there is a possibility of multiply realizing QM (at least in principle)

## Quantum consciousness and quantum computation

- So we are left with two basic positions:
  - There is quantum consciousness, but it's not about information processing, and (FA) doesn't apply here.
    - A classical position, but we still cannot in principle decide if QM would be surprised or not.
  - There is quantum consciousness, but it's computational, and as computational can be realized in many ways, so it's not so much quantum at all.
    - Basically, this is a *reductio*.