Title: It from Qubit: The Game Show

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Collection: It from Qubit 2023

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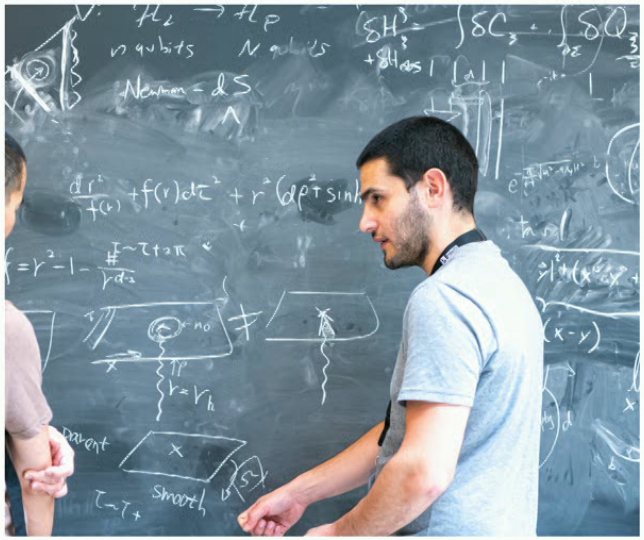
It from Qubit:
The Last Hurrah

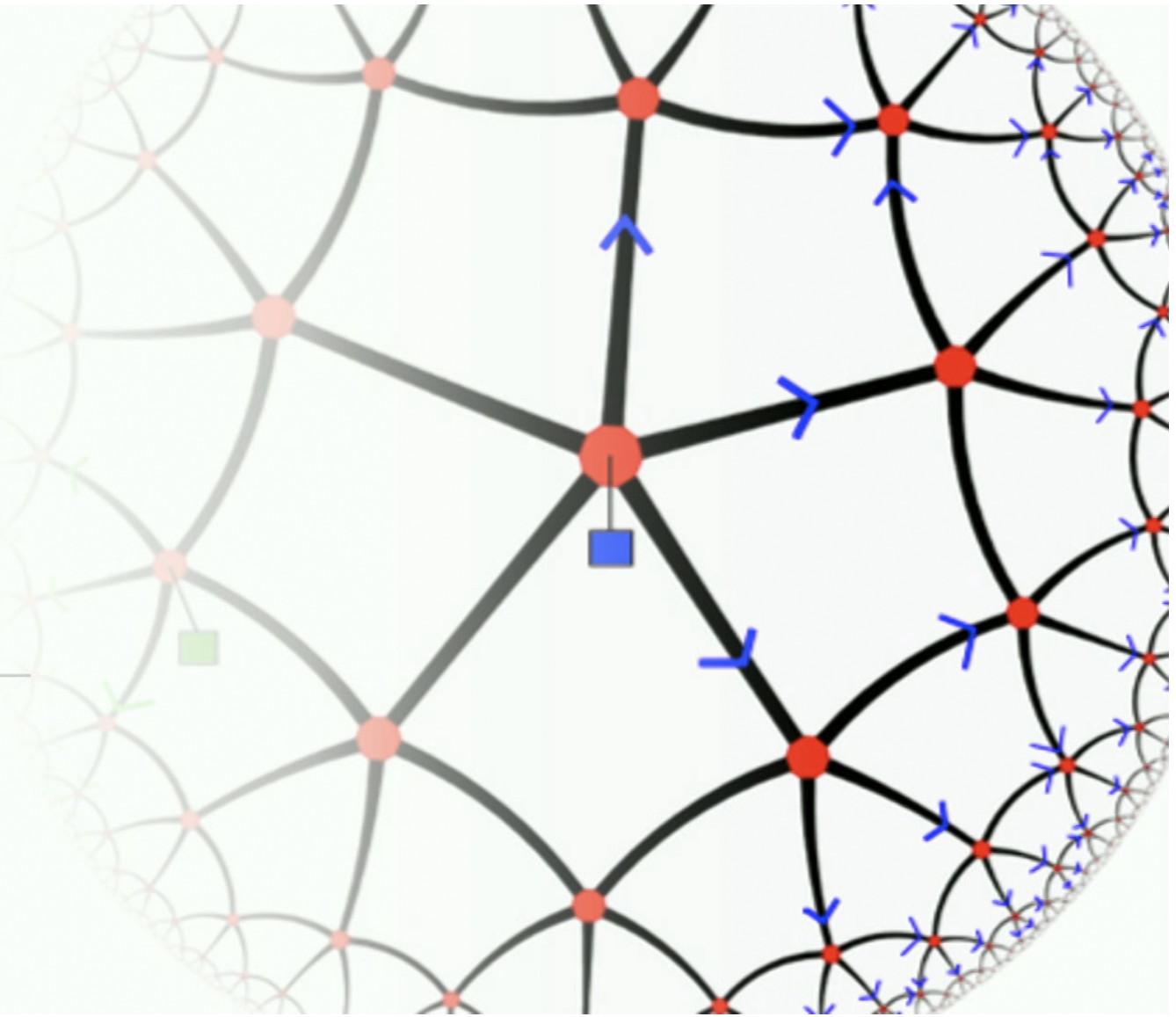
Perimeter Institute, 2023

Patrick Hayden



Say it ain’t so!

The It from Qubit Game Show



The interior of an old black hole and its radiation are

- A) Different aspects of the same thing
- B) Independent

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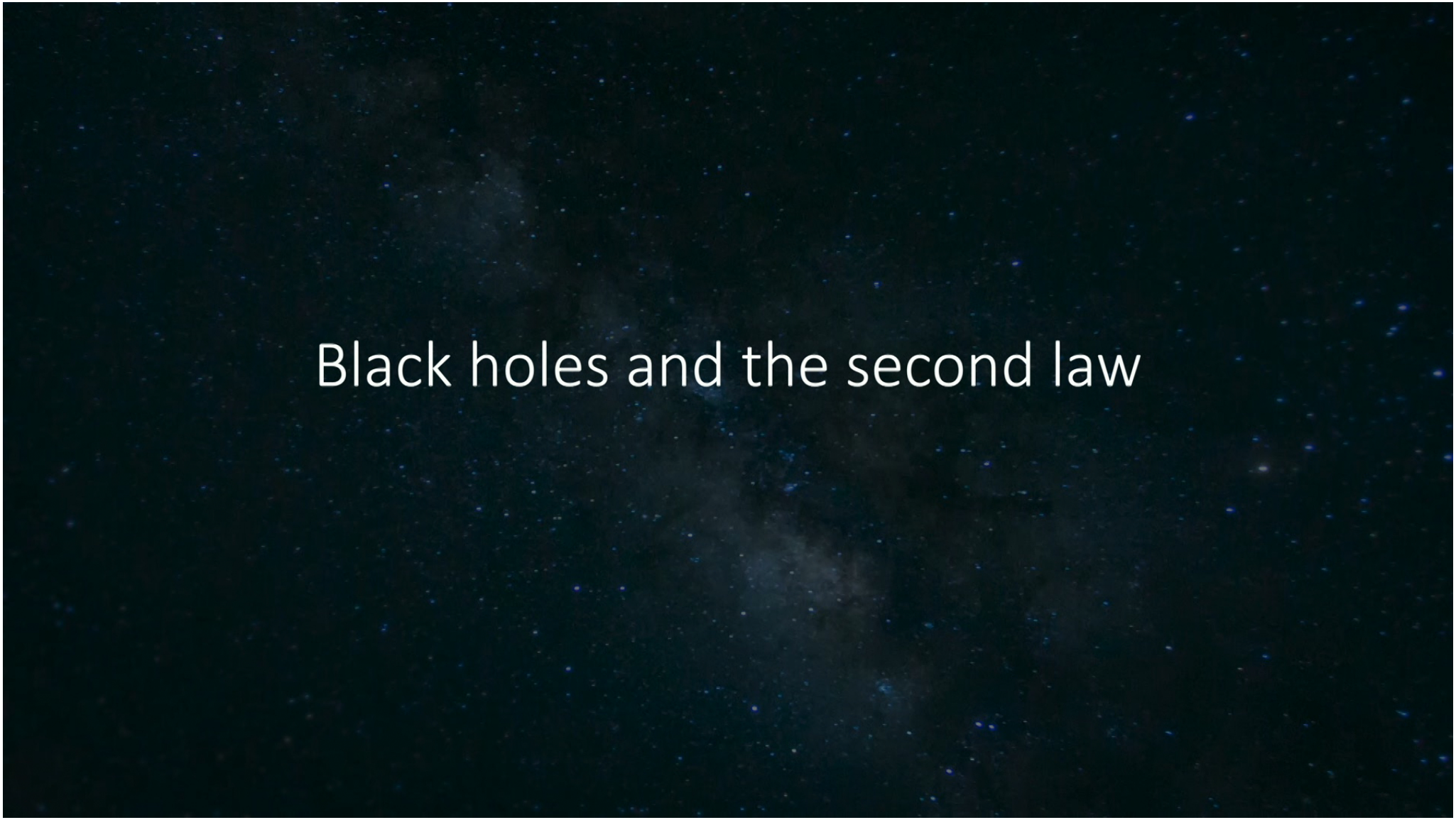
The interior of an old black hole and its radiation are

2 / 18 | Instructions | Responses | Clear responses | Exit

The black hole information paradox is

- A) Resolved
- B) Still vexing


Black holes and the second law

The c, A and F theorems in QFT are:

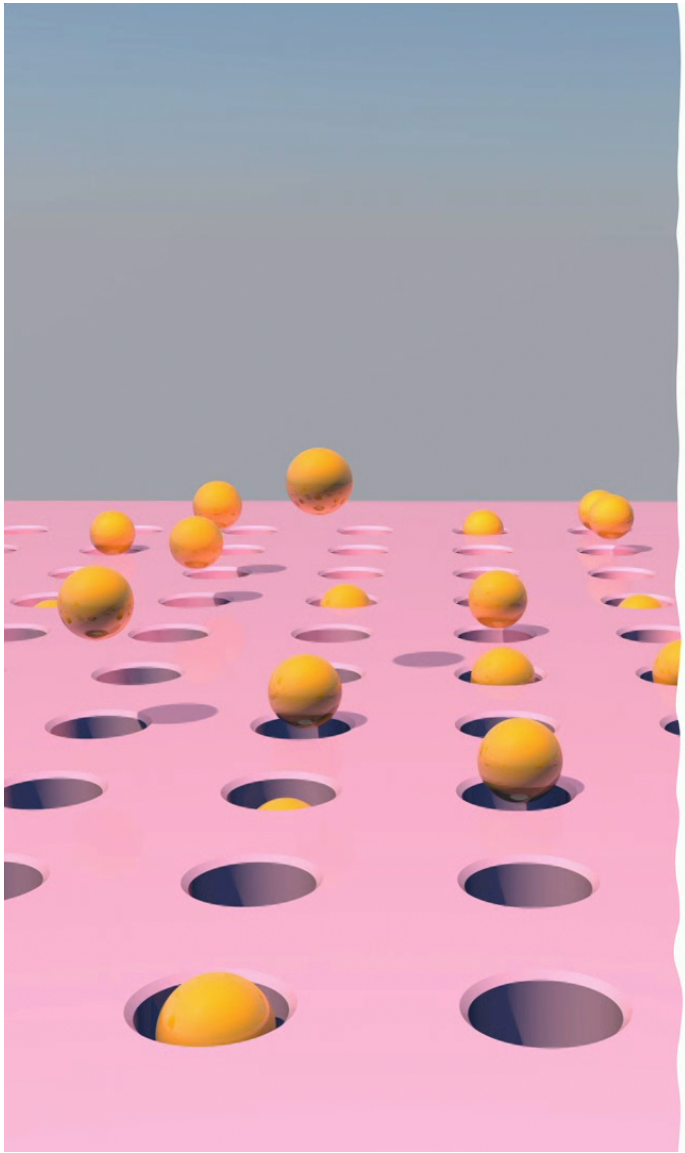
A) Deep consequences of the interplay between relativity and data-processing

B) Hopelessly poorly named

C) All of the above

Complexity =

- A) Action
- B) Almost anything
- C) Nothing of interest (to physicists)
- D) Something else of interest (to physicists)



In spacetimes containing black holes, computational complexity protects the validity of effective field theory:

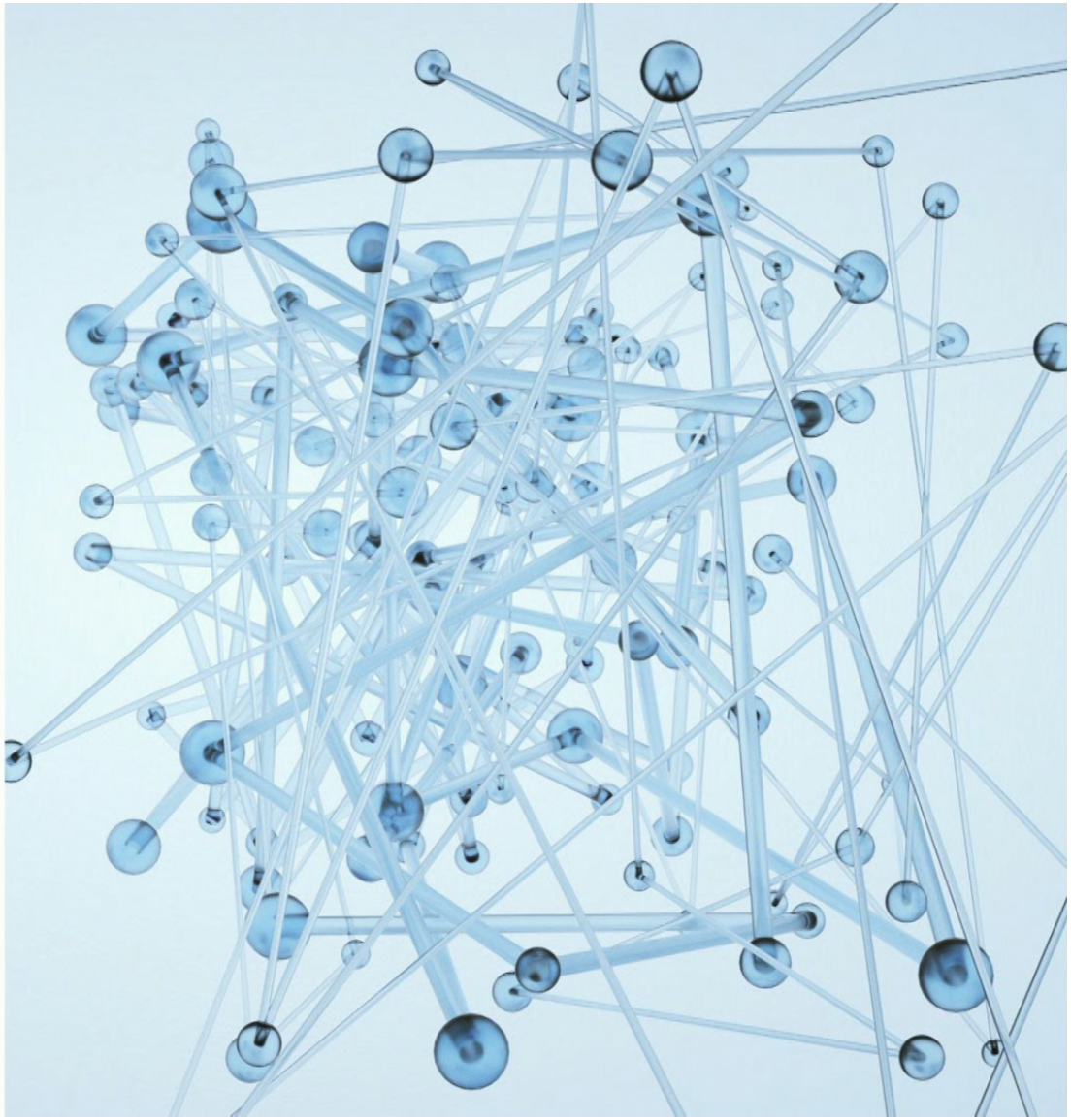
- A) An attractive idea
- B) A demonstrated fact
- C) An obvious falsehood

Does there exist a nonperturbative bulk description of quantum gravity in AdS?

- A) Yes
- B) No

There is a well-defined and reliable holographic construction of de Sitter quantum gravity. My preferred approach is:

- A) dS/CFT
- B) Double-scaled SYK
- C) de Sitter bubbles in AdS/CFT
- D) Other
- E) You said well-defined AND reliable. I'm still waiting.



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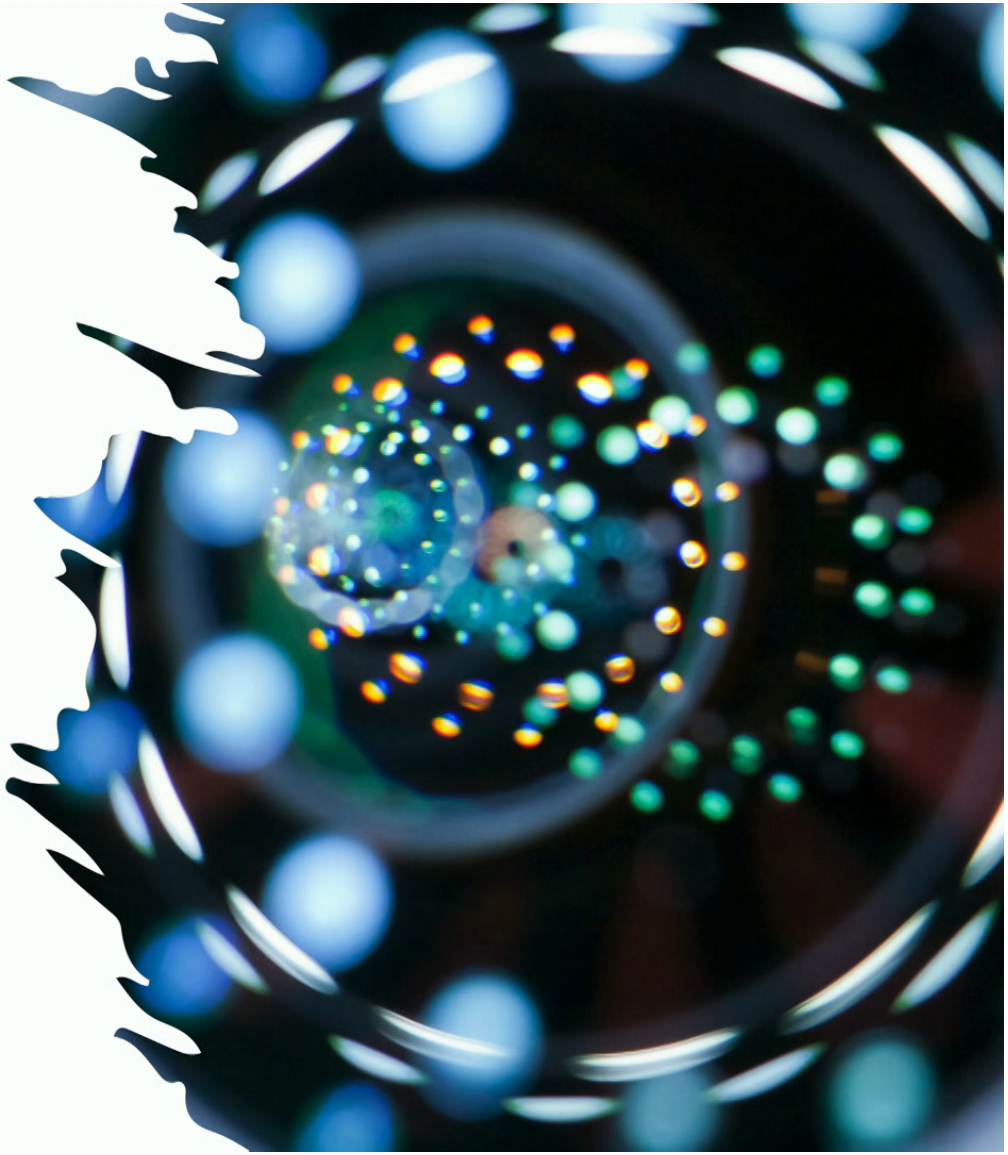
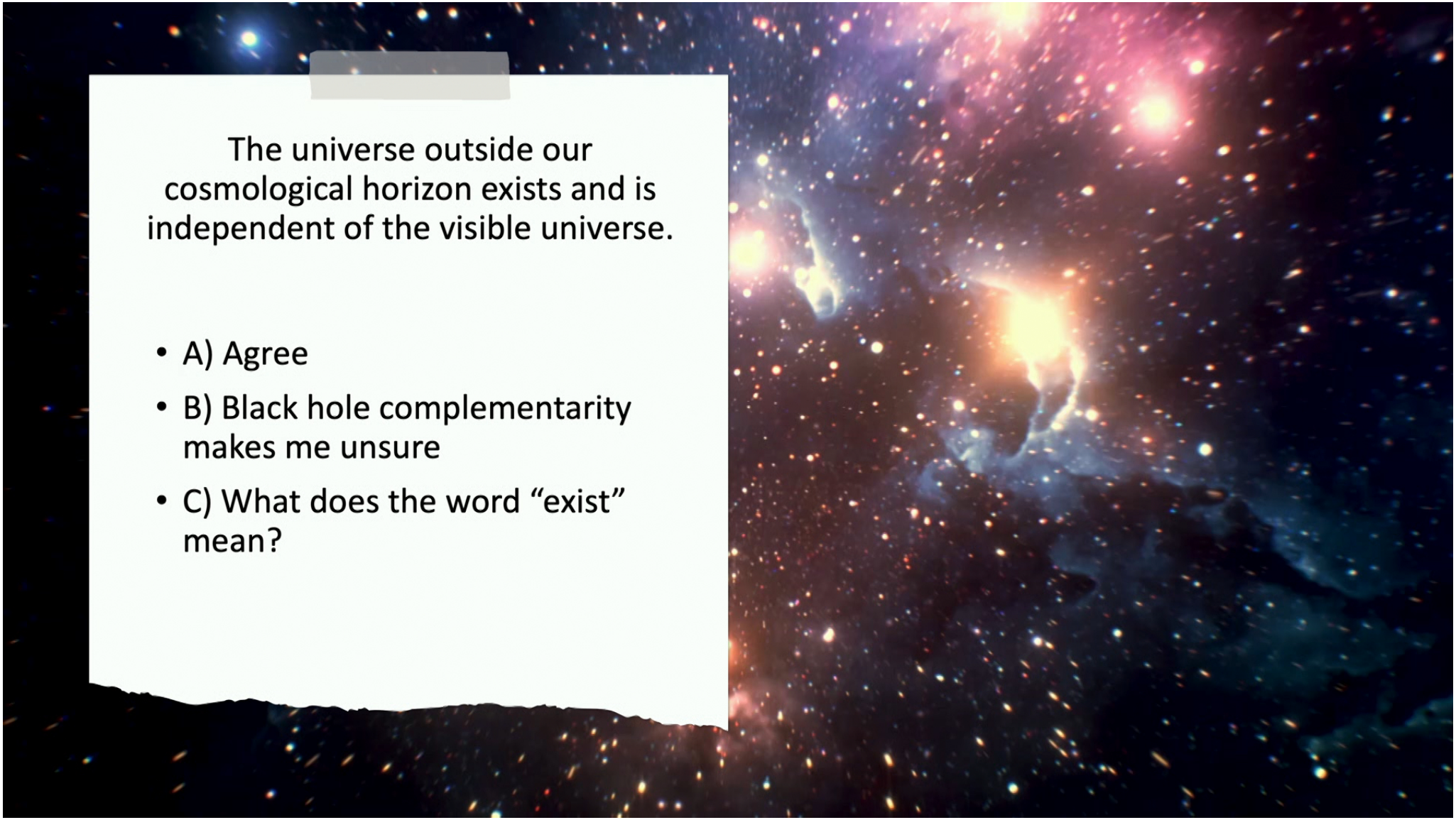
There is a well-defined and reliable holographic construction of de Sitter quantum gravity. My preferred approach is:

A wormhole was created in Google's lab in 2022:

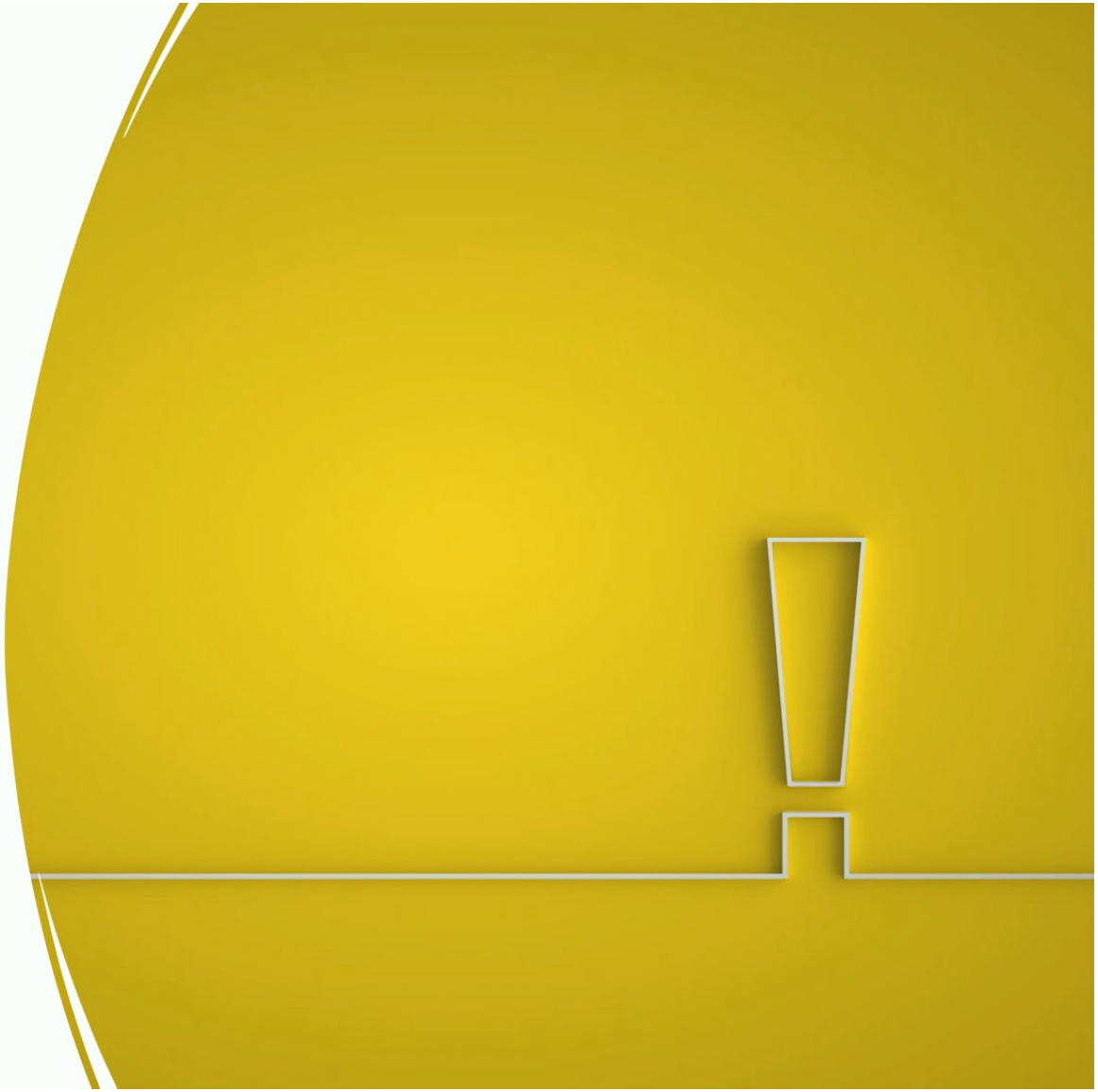
- A) True
- B) False
- C) Please define the term "wormhole"




The universe outside our cosmological horizon exists and is independent of the visible universe.
• A) Agree
• B) Black hole complementarity makes me unsure
• C) What does the word “exist” mean?

Time scale to an error-corrected quantum computer with 1000 qubits:

- A) Decade
- B) Decades (plural!)
- C) Century
- D) Not gonna happen



With all factors of k_B, $\hbar$ and c included:

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What is the Bekenstein-Hawking entropy of a black hole in (3+1) dimensions as a function of its area*?*