

Rethinking Quantum Information in Gravity and Fields

Opening Remarks by Masahito Yamazaki
September 13, 2026 @ UTokyo Hongo



Werner Heisenberg:

“The most fruitful developments frequently take place at those points where two different lines of thought meet.”

Steve Jobs:

"Creativity is just connecting things."

Quantum Gravity

Quantum Information

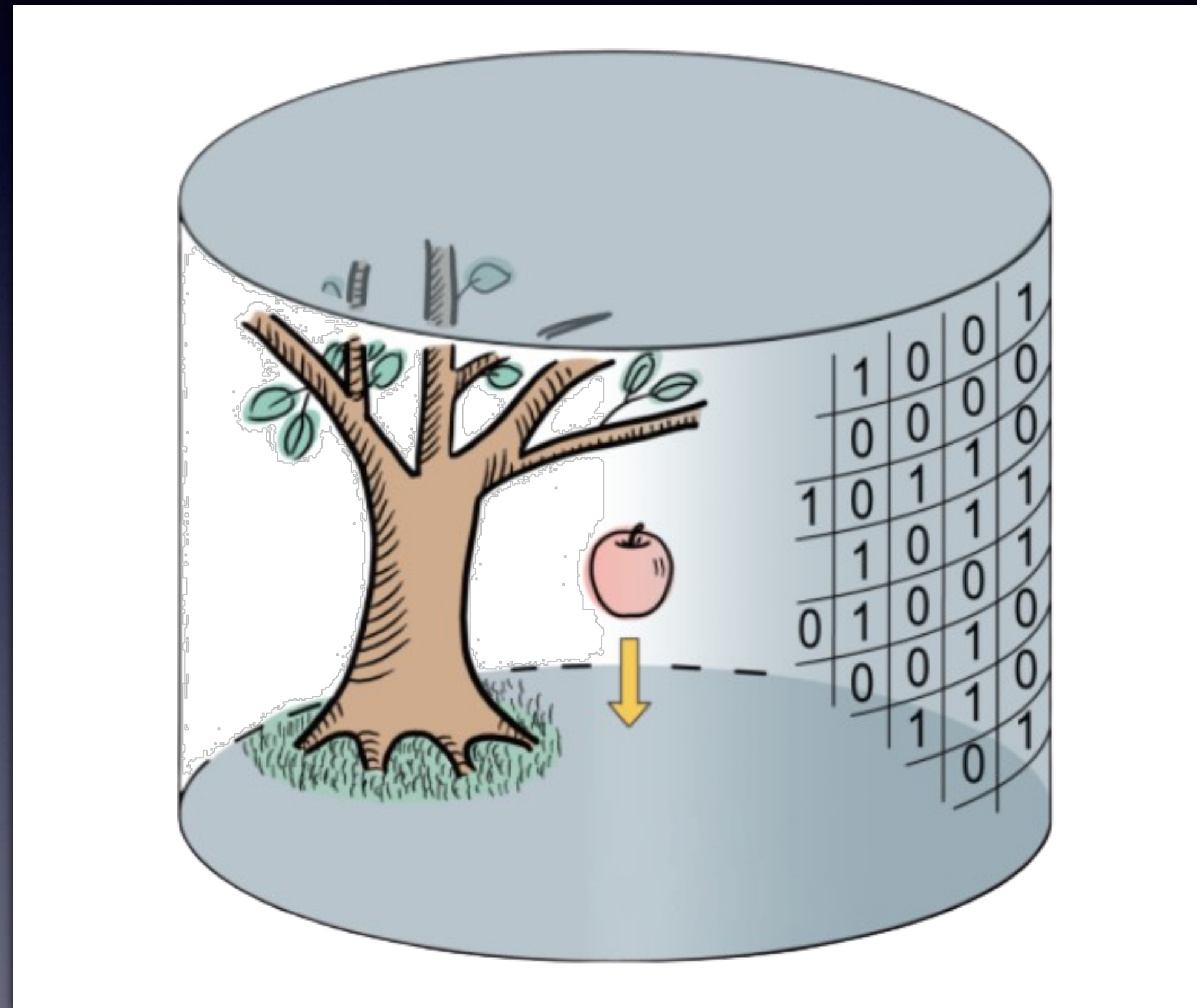


Figure from <https://web.physics.ucsb.edu/~davidgrabovsky/research.html>

Motivations

- Proposes **new research directions** which we believe is important/fundamental, rather than making an exhaustive list
- **Facilitate QG/QI interactions**
- Focus somewhat on **concrete problems** which can be answered in the coming several years, while touching on **conceptual problems**

[Submitted on 29 Jun 2026]

Rethinking quantum information in gravity and fields

Kanato Goto, Yuta Hamada, Kohtaro Kato, Takato Mori, Yoshifumi Nakata, Masataka Watanabe, Hayata Yamasaki, Masahito Yamazaki, Takuya Yoda

This paper presents a curated selection of research questions at the intersection of quantum gravity and quantum information, chosen to highlight issues that we regard as particularly important for researchers in both fields. We organize the discussion into four main themes: the operational characterization of observables, the role of observers, quantum error correction, and the infinite-dimensionality of Hilbert spaces. We hope that addressing these questions will engage researchers across both communities and further strengthen the profound interplay between the two disciplines.

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Organizational Principles

Section 2: **Operational characterization** ($\rightarrow$ Mori)

Section 3: **Observer** ($\rightarrow$ Goto)

Section 4: **Quantum Error Correction** ($\rightarrow$ Nakata)

Section 5: **Infinite Dimensionality** ($\rightarrow$ Yamasaki)

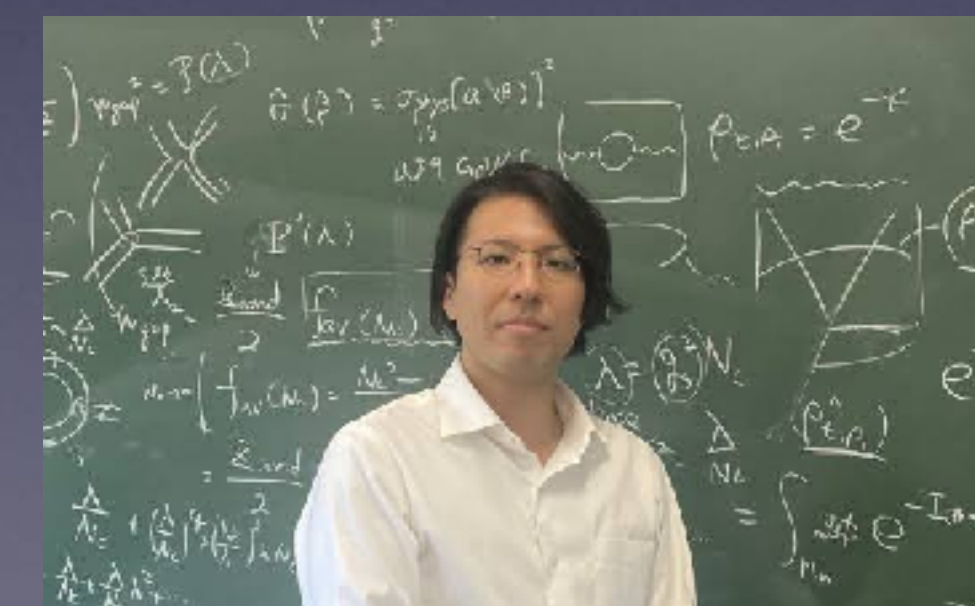
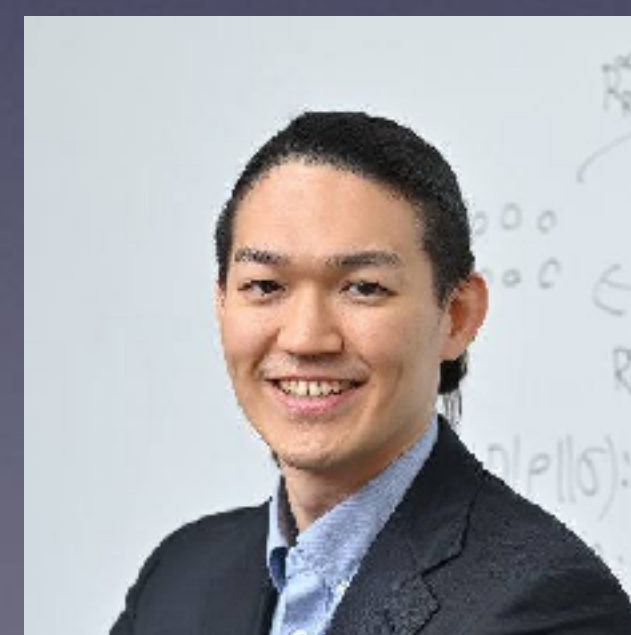


Today

Kanato Goto, Yuta Hamada, Kohtaro Kato, Takato Mori, Yoshifumi Nakata,



Masataka Watanabe, Hayata Yamasaki, Masahito Yamazaki, Takuya Yoda



Enjoy!

- We are primarily discussing **problems, not solutions.**
- **Questions/comments/discussions welcome**
- **Suggestions for your own problem?**
- Possibility of future activities

