

Title: Panel Discussion I: Where and when will Quantum Gravity crack? What are we missing?

Speakers:

Collection: Quantum Spacetime in the Cosmos: From Conception to Reality

Date: May 08, 2023 - 4:00 PM

URL: <https://pirsa.org/23050113>

Abstract: Zoom Link: <https://pitp.zoom.us/j/94575380034?pwd=Y21DMTRqeFFGNnd5dnVBc1dac2tUQT09>

- 1 - Nothing wrong; 200-yr from Newton  $\rightarrow$  Einstein
- empirical information
  - ~~Horava~~
  - ~~susy~~  $\approx$  ~~Naturalness~~
  - Technology  $\rightarrow$  100 yrs? Atomic clocks
  - Anomalies in Quantum Mechanics



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- empirical information

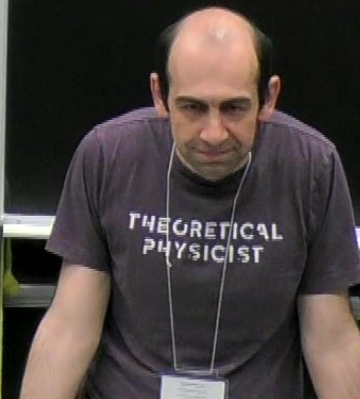
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- Anomalies in Quantum Mechanics

- Merging different Approaches





- Anomalies in Quantum Mechanics  $\rightarrow$  Gravity-Mediated Entang.
- Merging different Approaches

- Theoretical guidance v.s. anomalies
- UV/IR mixing  $\rightarrow$  Cosmological constant
- String theory  $\rightarrow$  ~~IFT~~
- Meaning of Area law for entropy  
     $\hookrightarrow$  de Sitter entropy



- Anomalies in Quantum Mechanics  $\rightarrow$  Gravity-Mediated Entang.
- Merging different Approaches  $\rightarrow \frac{1}{\sqrt{N_{\text{qubit}} \text{, ent.}}}$

- Theoretical guidance vs. anomalies
- UV/IR mixing  $\rightarrow$  Cosmological constant
- String theory  $\rightarrow$  ~~IR~~
- Meaning of Area law for entropy  
 $\hookrightarrow$  de Sitter entropy





Mechanics  $\rightarrow$  Gravity-Mediated Entang.  
 ent Approaches  $\rightarrow \frac{1}{\sqrt{N_{\text{orbit}} \text{, em.}}}$

nce v.s. anomalies

ng  $\rightarrow$  Cosmological constant

~~ERR~~

Area law for entropy  
 $\rightarrow$  de Sitter entropy

- Big Bang degrees of freedom, where do they come from?  $\rightarrow$  ~~ERR~~
- Very hard, no idea
- Job prospects  $\approx$  main stream?
- Review articles for graduate students
- Quantum / Classical transition?
- Community level direction?

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~~ETC~~

Area law for ent.  
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- ~~Right networks~~  $\rightarrow$  jobs?  
 Convince right people
- Connect tools  $\rightarrow$  observations  
 theoretical