

Title: Welcome and Opening Remarks

Speakers: Niayesh Afshordi

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

Date: May 08, 2023 - 9:15 AM

URL: <https://pirsa.org/23050146>

Welcome to

Quantum Spacetime in the Cosmos:

From Conception to Reality



Land Acknowledgement

- We acknowledge that we are situated on the traditional territory of the Anishinaabe, Haudenosaunee, and Neutral peoples.
- Perimeter Institute is located on the Haldimand Tract. After the American Revolution, the tract was granted by the British to the Six Nations of the Grand River and the Mississaugas of the Credit First Nation as compensation for their role in the war and for the loss of their traditional lands in upstate New York. Of the 950,000 acres granted to the Haudenosaunee, less than 5 percent remains Six Nations land. Only 6,100 acres remain Mississaugas of the Credit land.
- We thank the Anishinaabe, Haudenosaunee, and Neutral peoples for hosting us on their land.

Red Dress Day

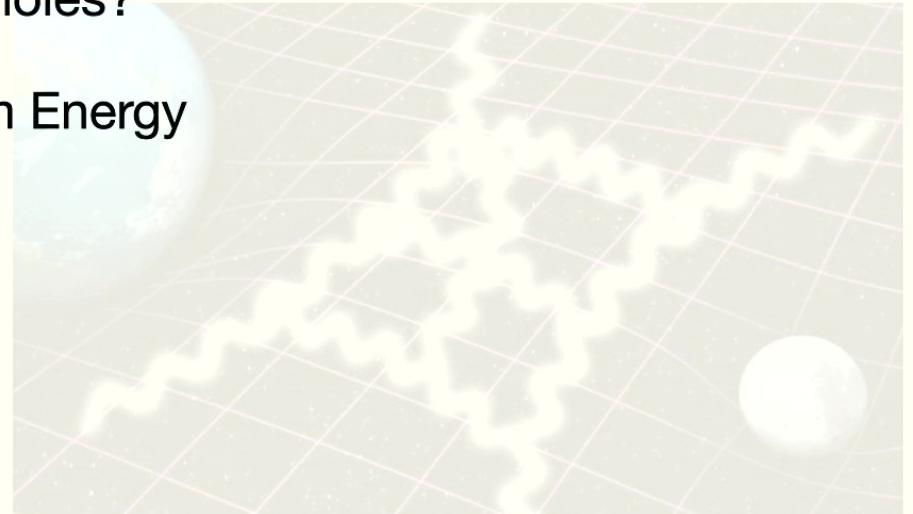
May 5th



- Red Dress Day marks the National Day of Awareness for Missing and Murdered Indigenous Women, Girls, and Two-Spirited people in Canada.
- More than 1,000 murders of Indigenous women, girls and Two-Spirited people were recorded by police between 1980 and 2012. It is estimated that 4,000 Indigenous women, girls, and Two-Spirited people have gone missing during that same period.

Chasms amongst our best theories and observations

- Quantum Mechanics + Relativity $\rightarrow \infty$
- Singularities @hearts of Big Bang and Black Holes
- Information lost in evaporation off black holes?
- Dark Energy $< 10^{-60} \times$ Quantum Vacuum Energy
- Is Particle Physics “Natural”?



Quantum Gravity

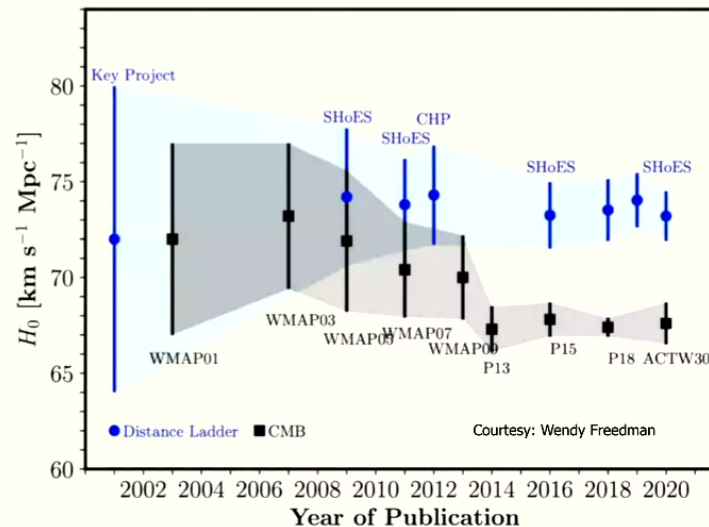
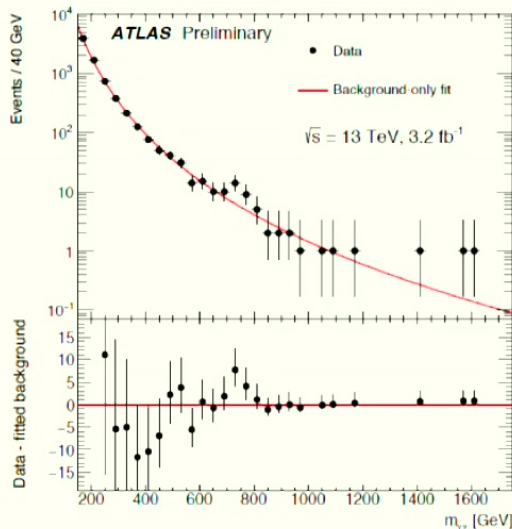
Too much of a good thing?

- String Theory and Holography
- Loop Quantum Gravity and Spin Foams
- Asymptotic Safety
- Causal Dynamical Triangulation
- Causal Sets
- Horava-Lifshitz gravity
- ...

Olena Shmahalo/Quanta Magazine

Anomaly-Industrial Complex

- Undeniable draw of young scientists to chase latest exciting experimental anomalies → maximize citations?
- Does this help or hinder the progress of science?



In his farewell address, President Dwight D. Eisenhower famously warned U.S. citizens about the "military-industrial complex".

Intellectual Stagnation?

The Dark Energy Crisis, and the Prospect of Intellectual Stagnation

Christopher Stubbs

Department of Physics
Department of Astronomy
Harvard University
stubbs@physics.harvard.edu

But...

What if:

Measurements continue to favor $w = -1$

No deeper theoretical ideas emerge

LHC gives vanilla Higgs and little else

...

Then, things look bleak. It will be difficult to extend existing techniques to the milli- w level.

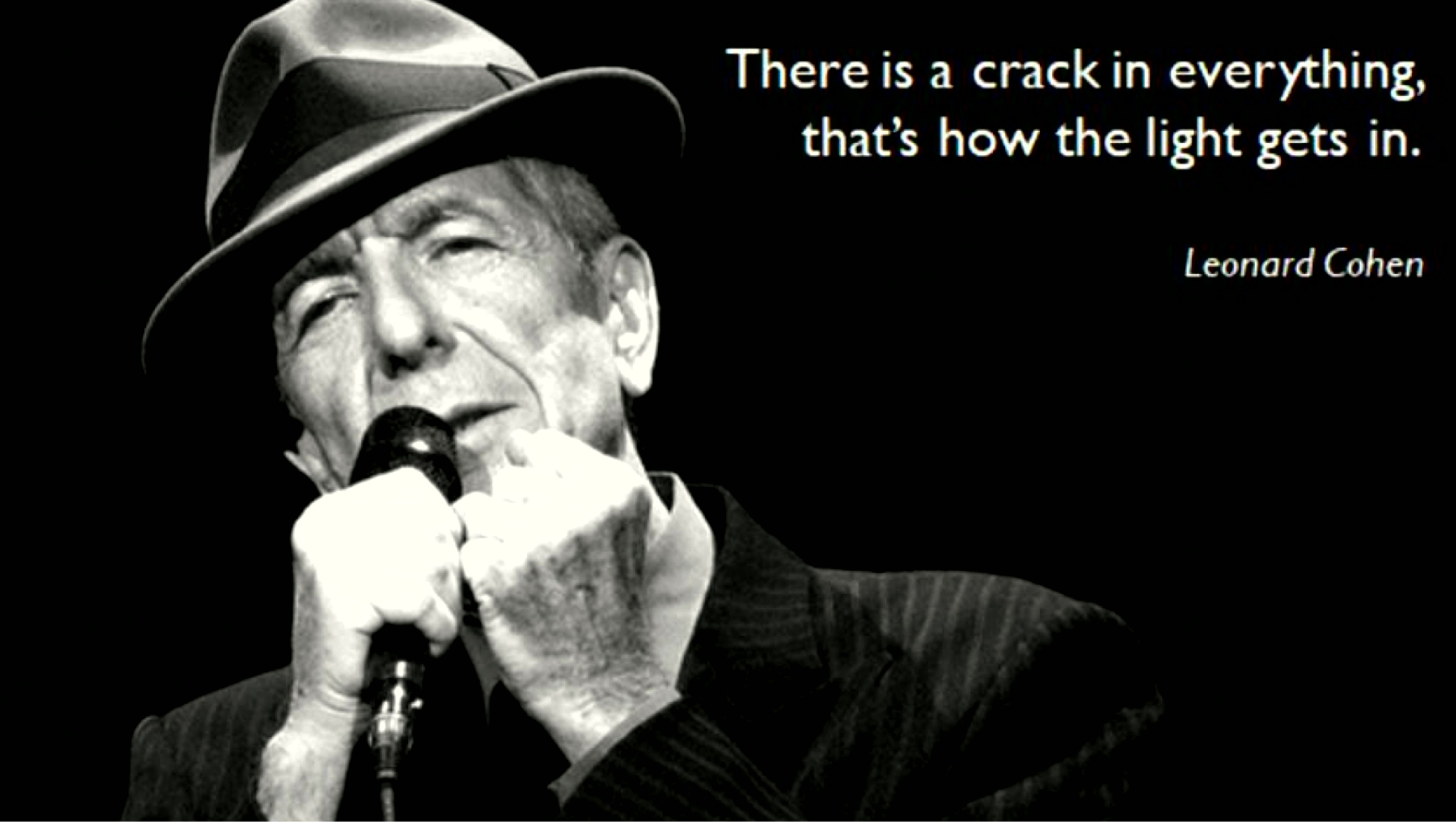
The Dark Ages- scenario 3: intellectual stagnation

"Dark Ages" is a term referring to the ...period marked by cultural, intellectual, and economic deterioration followed by intellectual and religious intolerance, stagnation and poverty...

- Wikipedia

<http://pirsa.org/11040058/>

April 20, 2011

A black and white photograph of Leonard Cohen. He is wearing a dark fedora with a light-colored band. He is holding a vintage-style microphone with both hands, positioned near his mouth. His face is partially in shadow, and he has a contemplative expression. The background is dark.

There is a crack in everything,
that's how the light gets in.

Leonard Cohen

Emergence

Can novel insights emerge from bringing diverse ideas?

- **Today:** Where and when will Quantum Gravity crack? What are we missing?
- **Tomorrow:** Do we need Quantum Gravity to crack the Big Bang? Is inflation fact or fiction?
- **Wednesday:** Holography: fact or fiction?
- **Thursday:** UV/IR coupling in Quantum Gravity: Feature or Bug?
- **Friday:** An inclusive roadmap for cracking Quantum Gravity

Physics, Astronomy, and Philosophy

- Inclusivity of all ideas and people
- What can we learn from each other?
- Plan the roadmap for the future of quantum spacetime