

# Future directions in (L)QG

Tackling the big questions

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# The future is... you!

- We need **young people** to develop **new research directions!**

## Develop your own research program!

- What are the **methods** that you are **an expert** in?
  - Which **open problems** can you tackle with these tools?
  - Work on creating a **unique research profile!**
- 
- Look at **other approaches** to quantum gravity!



# Diversity

We need **voices** from **marginalized groups!**

- **People of color, gender minorities**, socio-economic background,...
- **Plenary speakers:**
  - 3/20 of (planned) speakers are women: 15%
  - 6/20 of (planned) speakers not from Europe, US, Canada
- **Accessibility** for people with disabilities
- Build on **remote access** → **hybrid conference**
- Implement a **Code of Conduct**
- Low visibility of **queer / LGBTQA+ people** in the community

We must all work towards **making our community welcoming!**

# What is quantum space-time?

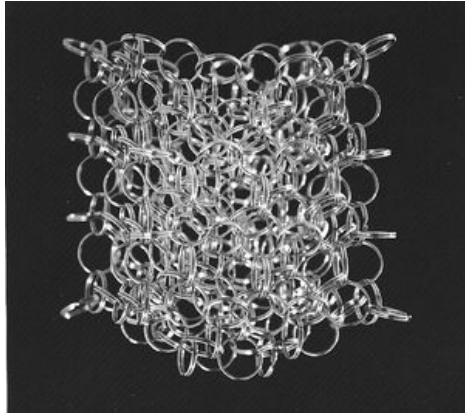


Figure: Source: <http://www.spacetimeandquantum.com/>

# Unraveling quantum space-time

**Our strength:** Quantum space-time as pre-geometric, **quantum building blocks**

- Dynamics and **Numerics** [Pietro Donà] [Muxin Han] [Madhavan Varadarajan] [Kristina Giesel]
- **Renormalization / Continuum limit** [Sylvain Carrozza] [Bianca Dittrich] [Jonathan Engle] [Carlo Rovelli]
- (Local) **Holography** [Laurent Freidel] [Daniele Pranzetti] [Miguel Campiglia] [Philipp Höhn]
- Emergence [Abhay Ashtekar] [Daniele Oriti] [Eugenio Bianchi]
- Causal (micro)structure / Topology change [Bianca Dittrich]
- **Observables** [Philipp Höhn]

Can we recover a **continuum metric**?

Is (L)QG an **effective field theory** on large scales?

# Matter matters... but how?

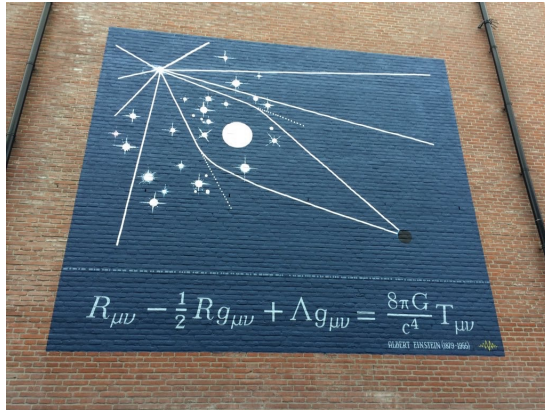


Figure: From a wall in Leiden (NL)

# Adding matter to the mix

**Our strength:** we can couple any matter to (L)QG

- Quantum space-time **affects matter** [Cong Zhang]
- Reduced phase space quantisation [Kristina Giesel] [Muxin Han] [Daniele Oriti]

Does (L)QG put **restrictions on the matter sector**?

Does **quantum gravity** affect **matter fields**?

Recover **QFT** on a **fixed background**?

How does matter **propagate** on a quantum space-time?

What is **matter** at the **Planck scale**?