# My (Miklos Långvik) road here

- PhD in Helsinki on Noncommutative spacetime and magnetic monopoles

- 1 year postdoc in Marseille with an interest in spinfoam divergences

- 2 years (Marseille) + 1 year (Helsinki) postdoc with an interest in see "this talk"

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Research interests: Quantum Gravity, Twistors and anything 4d Minkowski conformal
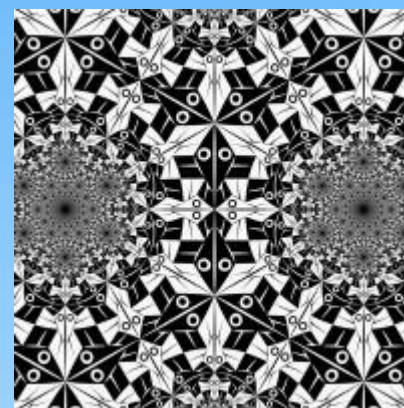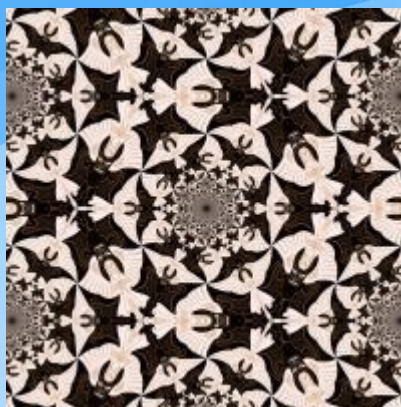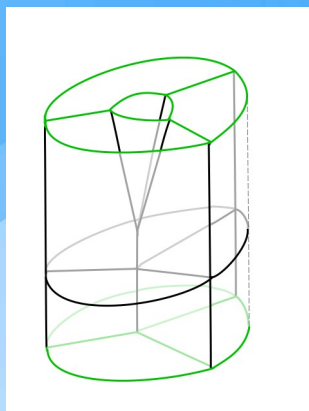
The background to my research

- LQG: a continuum theory that aims to quantize non-perturbative GR via connection, tetrad variables

- Spinfoams: an intended to be path intergral rep. Of LQG
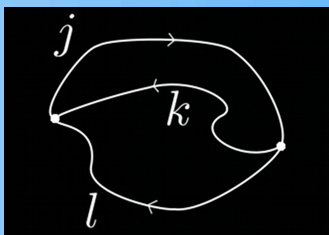
spinnetwork   spinfoam

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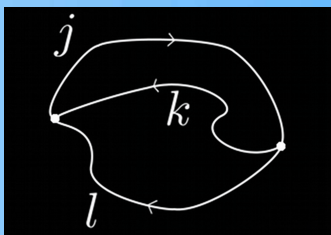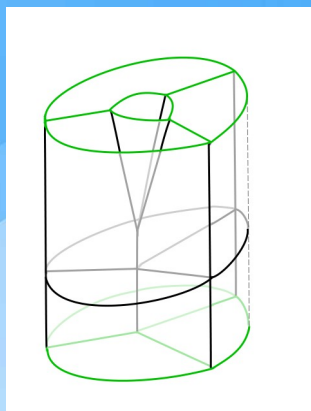- Spinfoams: an intended to be path intergral rep. Of LQG

- Problem for LQG and spinfoams: **dynamics**

- Matter dofs haven't been considered seriously in loop gravity. They can be included, but serve no purpose.

- Idea: Minkowski 4d conformal matter, both geometrical and ok with the Standard Model
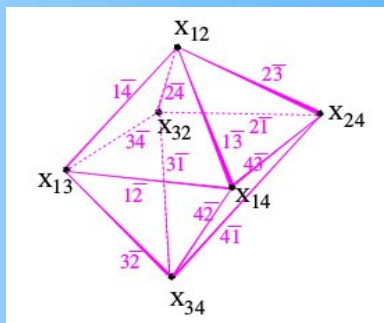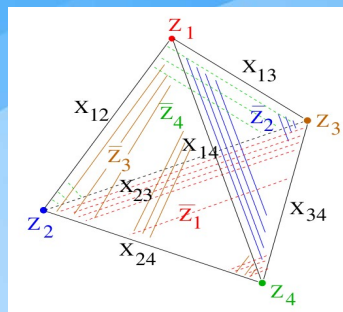
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My current research project

- We've built the phase-space of SU(2,2) as a symplectic manifold and à la the recipe used for spinnetworks.

- In our case every node is associated with a null octahedron and equating 4 1st class constraints plus 1 1st class constraint that sets the determinant to 1, gives the SU(2,2) spinnetwork
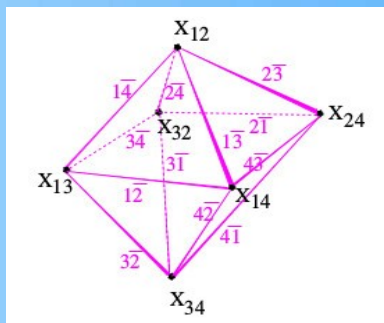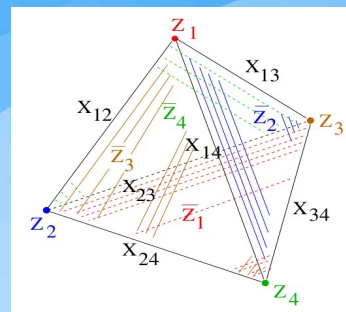

null octahedron

null octahedron projectively

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- Where to next:

   1) Conformal matter: Embedd $SU(2.2) \simeq SU(1,1) \times SU(2) \times SU(2) \times SU(2) \times SU(1,1)$ into the states of the spinfoam models with both time-like and space-like faces.
   2) Study semi-classical causality in spinfoams.
   3) See how our phase-space could be useful for 4d Minkowski CFTs.
   4) Possibly construct SU(2,2) Regge calculus if it can be used to understand causality in simplicial GR.

null octahedron

null octahedron projectively