

Motivation

Minkowski

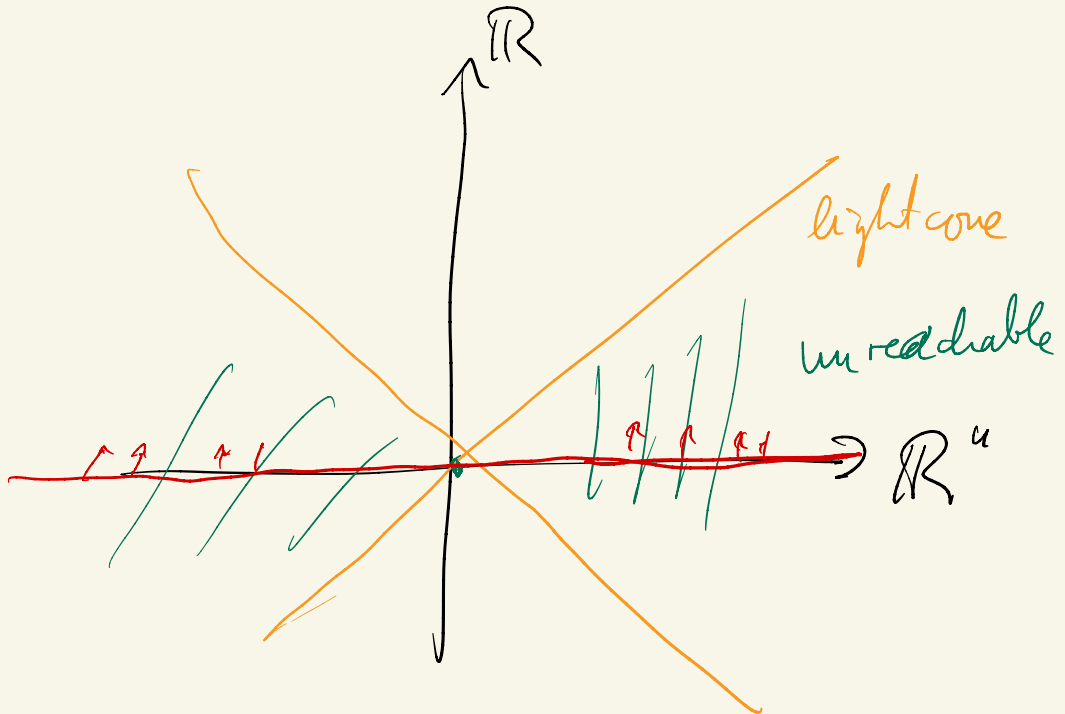
$$\mathbb{R}^{n+1} = \mathbb{R} \times \mathbb{R}^n$$

time space

$0 \times \mathbb{R}^n$ presence in our inertial system

$(0, \infty) \times \mathbb{R}^n$ "future", partly unreachable

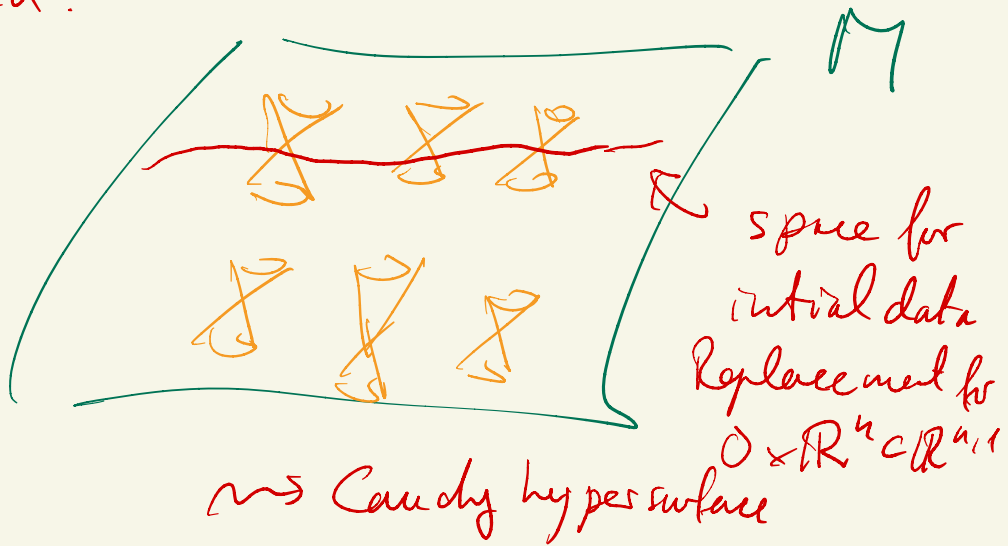
$(-\infty, 0) \times \mathbb{R}^n$ "past"



Want statements of the form

If our world has "now"
properties ..., then there
... black hole formation
big bang in the past

We need: A replacement for the
"presence" (Gegenwart) in Lorentzian
mf.d.



• Different ways to characterize

Cauchy hypersurfaces.

• Not every time-oriented Lorentzian manifold has a Cauchy hypersurface.

Every Cauchy hypersurface will be achronal.