

slide: present-day accelerated expansion

- No a-priori assumptions on dynamical model / Cosmographic analysis [Matt Visser]
- Concerning the Hubble law, one has to check the convergence radius of the Taylor series, and whether finite truncations give good approximations. Such problems can be solved by considering different length parameters and/or transformations of the redshift parameter.

slide: Klein geometry

- Before we discuss the essentials of Cartan geometry, which incorporates gravity, let us first look to Klein geometry, which describes special relativity from a Lie theoretic point of view.
- There are of course a lot of examples of homogeneous spaces, but given our area of interest, the most relevant are given by Minkowski and de Sitter space.
- Felix Klein (1872) understood that each homogeneous geometry was characterized by a continuous group of transformations which connect any two points in the space.
- The isotropy group of a point is the subgroup that leaves that point fixed.
- This way one can see that the homogeneous space is given by the space of cosets.
- Special relativities are characterized by Klein geometry, and the shift to a Lie group description makes it manifest that the space of special relativity becomes a de Sitter space when the kinematic group is deformed to a de Sitter group.
- But what kind of geometry do we need to incorporate gravity in the description?