

Relativity

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Outline

- Generalities on “motions”, “space” and “time”.
 - Galilei’s group.
 - Symplectic structure of the space of newtonnian motions.
 - The principle of relativity: Galilean relativity.
 - The moment map: the invariants of motion.
 - The barycentric decomposition: the mass as a cohomology class.
 - Homogeneous symplectic spaces: coadjoint orbits
 - Classification of elementary systems in galilean mechanics
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- Special relativity: Poincaré’s group.
 - Geodesics in special relativity, symplectic structure.
 - Vanishing cohomology of Poincaré’s group: $E = mc^2$
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- Pseudo riemannian manifolds: geodesics, curvature etc.
 - Passive equation of motion in a gravitational field: eulerian distributions.
 - Geodesics as eulerian distributions, no go interaction theorem.
 - Continuous media, strings etc. As eulerian distributions.
 - Einstein’s equations.
 - Schwartzild model, deviation of the light by stars and precession of Mercury’s perihelion.
 - Cosmological model: Friedman-Lemaitre’s metric.

On the web

Informations on the course will be found at <http://math.huji.ac.il/~piz/Site/General%20Relativity.html>

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<http://www.math.huji.ac.il/~piz/>
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