Geometric Foundations of Gravity 2025



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Cartan geometry and gravitation

It was discovered by the French mathematician Elie Cartan that the geometry of a surface could be revealed by rolling a ball on it. Remarkably, the mathematical description of this rolling process involve ingredients familiar from modern gauge theories. Cartan-geometrical descriptions of General Relativity and teleparallel gravity are presented and it is argued that typically Cartan-geometric descriptions of gravity will introduce new - and potentially phenomenologically relevant - degrees of freedom in the gravitational sector.

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