THE UNIVERSITY   **OF HONG KONG**

Institute of Mathematical Research
Department of Mathematics

COLLOQUIUM

Teleparallel Gravity as a Higher Gauge Theory

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Time: 4:00 – 5:00pm

Venue: Room 210, Run Run Shaw Bldg., HKU

Abstract

Higher gauge theory uses '2-connections' to describe parallel transport not only along curves, but also over surfaces. Just as gauge theory uses Lie groups, higher gauge theory uses Lie 2-groups. We show that general relativity can be viewed as a higher gauge theory. On any semi-Riemannian manifold M, we construct a principal 2-bundle with the the 'teleparallel 2-group' as its structure 2-group. Any flat metric-preserving connection on M gives a flat 2-connection on this 2-bundle, and the key ingredient of this 2-connection is the torsion. Taking advantage of Einstein and Cartan's formulation of general relativity in which a flat connection and its torsion are key ingredients, this lets us rewrite general relativity as a theory with a 2-connection for the teleparallel 2-group as its only field.

All are welcome