

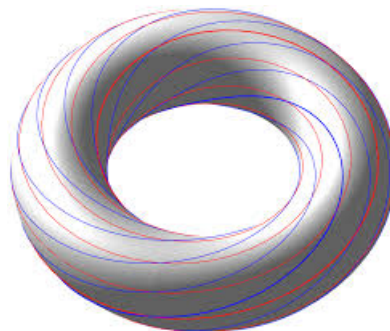
## Oberseminar Geometrie

Department of Mathematics

University of Fribourg

**Physics 2.52**

Wednesday, 15 May 2024, 10:20



PATRICK GHANAAT (UNIFR)

### Almost flat manifolds

This expository talk will be centered on one of the classical “pinching” theorems of Riemannian geometry, due to Gromov in its original form: Compact connected manifolds admitting a Riemannian metric with suitably small curvature are diffeomorphic to infra-nilmanifolds.

Flat Riemannian manifolds are quotients  $\Lambda \backslash \mathbb{R}^n$  of euclidean  $\mathbb{R}^n$  by a discrete group  $\Lambda$  of isometries. More generally, infra-nilmanifolds are quotients  $\Lambda \backslash N$  of a nilpotent Lie group by a discrete group  $\Lambda$  of isometries of a left invariant Riemannian metric on  $N$ .

We will begin with background on nilpotent Lie groups, their metrics, isometries and quotients, then explain the history and versions of the theorem, outline a proof following ideas of Auslander, and discuss some closely related questions.