

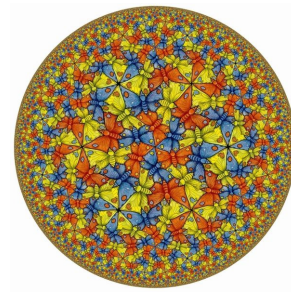
## **Oberseminar Geometrie**

Department of Mathematics

University of Fribourg

Seminar room, Math II (Lonza)

**Wednesday November 13, 2019, 10:20**



PATRICK GHANAAT (UNIFR)

### **Spectrum of framed Riemannian manifolds and Nomizu's vanishing theorem**

Nomizu's theorem states that the de Rham cohomology of a compact nilmanifold coincides with its Lie algebra cohomology. We consider general manifolds equipped with a frame field (or parallelization). Examples are Lie groups furnished with left invariant vector fields, their quotients by discrete subgroups, total spaces of principal bundles carrying a Cartan connection, and all orientable three-manifolds. The talk provides a review of the basic differential geometry of such spaces in terms of the torsion tensor of the associated flat connection. We then focus on the Laplacian and de Rham cohomology, generalizing Nomizu's theorem, in order to obtain a lower bound on the torsion for manifolds with a large Betti number.