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*Principal bundles in noncommutative Riemannian geometry*

Quantum principal bundles have been studied extensively from a Hopf-algebraic perspective since the early 1990s, but adapting this work to the context of spectral triples has only become possible relatively recently. In this talk, I'll sketch out one possible framework for noncommutative differentiable principal bundles with compact connected Lie structure group in terms of spectral triples and their constructive factorisations in unbounded  $KK$ -theory. This is joint work (in progress) with Bram Mesland.