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Quantum Groups on Fibre Bundles

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Abstract: It is shown that the principle of locality and noncommutative geometry can be connected by a sheaf theoretical method. In this framework quantum spaces are introduced and examples in mathematical physics are given. Within the language of quantum spaces noncommutative principal and vector bundles are defined and their properties are studied. Important constructions in the classical theory of principal fibre bundles like associated bundles and differential calculi are carried over to the quantum case. At the end q-deformed instanton models are introduced for every integral index.

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