DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
UNIVERSITY OF SOUTHERN DENMARK, ODENSE

Mathematics seminar

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Localizing gauge theories from noncommutative geometry

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Abstract

We review the emergence of a generalized gauge theory from a noncommutative Riemannian spin manifold, viz. a real spectral triple (A,H,D;J). This includes a gauge group determined by the unitaries in the *-algebra A. Our main new result is the interpretation of this generalized gauge theory in terms of an upper semi-continuous C*-bundle on a (Hausdorff) base space X. The gauge group acts by vertical automorphisms on this C*-bundle and can (under some mild conditions) be identified with the space of continuous sections of a group bundle on X. This then allows for a geometrical description of the group of inner automorphisms of A. We exemplify our construction by Yang-Mills theory and toric noncommutative manifolds and show that they actually give rise to continuous C*-bundles, which we explicitly determine.