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Middletown, CT 06457. *Categorified Bundles and Classifying Spaces*. Preliminary report.

In the pursuit of geometrically defined cohomology theories, certain generalizations of the theory of vector bundles are studied. For a particular type of 2-category, Baas, Bökstedt and Kro define an associated concept of principal 2-bundles. They showed that the geometric nerve of a suitable 2-category is the classifying space of the associated principal 2-bundles. When the 2-category is actually a 2-group, Baez and Stevenson proved that principal 2-bundles are also classified by “non-abelian cohomology”. We define a notion of equivariant 2-bundles, and discuss their classifying spaces as well as their relation to generalized representations of groups. (Received August 06, 2008)