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Matroid bundles and characteristic classes

A matroid bundle is a combinatorial model for a real vector bundle, with a simplicial complex as base space and combinatorial objects called *oriented matroids* as fibers. Matroid bundles are a generalization of Gelfand and MacPherson's *combinatorial differential manifolds*, which have led to new combinatorial results on characteristic classes of differential manifolds. Recent work (some joint with Eric Babson of the Institute for Advanced Study and James Davis of Indiana University) has illuminated the relationship between the categories of matroid bundles, real vector bundles, and PL microbundles and their respective characteristic classes.