

1062-05-261

**James F. Davis\*** ([jfdavis@indiana.edu](mailto:jfdavis@indiana.edu)), Department of Mathematics, Indiana University, Bloomington, 47401. *Characteristic Classes of Matroid Bundles and Applications.*

Oriented matroids are a combinatorial incarnation of linear algebra. By considering oriented matroids parameterized by a poset, one is lead to the notion of a matroid bundle, which is a combinatorial incarnation of a vector bundle. In earlier work we proved the Combinatorialization Theorem, by which every vector bundle gives a matroid bundle, the Spherical Quasifibration Theorem which said that every matroid bundle gives a spherical quasifibration, and the Comparison Theorem which says that composite of the above two transformations coincides with the map that deletes the zero section of a vector bundle. Thereby we showed the matroid bundles have Stiefel-Whitney classes.

Stiefel-Whitney classes have application to intersection questions in convex geometry. In this talk we will review the theory of matroid bundles above and give applications to the existence of covectors, analogous to intersections of affine linear subspaces with convex sets. (Received August 11, 2010)