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**William Chin\*** ([chin.bill@gmail.com](mailto:chin.bill@gmail.com)), Dept. of Mathematical Sciences, DePaul University, Chicago, IL 60610. *Galois coverings of coalgebras.*

We introduce the concept of a Galois covering of a pointed coalgebra. By an analog of a fundamental result of Gabriel, a pointed coalgebra embeds into the path coalgebra of its quiver. Topological coverings of quivers are used to construct covering coalgebras, including a universal covering for a path subcoalgebra of the path coalgebra. The theory developed shows that Galois coverings of coalgebras can be expressed by smash coproducts using the coaction of the automorphism group of the covering. Thus the theory of Galois coverings of pointed coalgebras is seen to be equivalent to group gradings of coalgebras, and representations of coverings are equivalent to graded comodules. Gradings in connection to coverings of quivers and representation theory were studied in the 80's by Green, Martinez-de la Pena, Bongartz and Gabriel, Riedtman, and recently for k-categories by Cibils and Marcos. One feature of the coalgebra theory is that neither the grading group nor the quiver is assumed finite in order to obtain a smash product coalgebra. (Received January 18, 2012)