I will present the role of groups with periodic cohomology when studying the following problems.
1. When is the Tate cohomology functor faithful on the thick subcategory generated by $k$, the trivial representation of $G$?
2. When is the Tate cohomology of a finitely generated $kG$ module finitely generated over the Tate cohomology of $G$ with coefficients in $k$?
3. Which groups occur as the group of units of a ring?
This is based on joint projects with Jon Carlson, Jan Minac and Keir Lockridge.