GEORGE ELLIOTT, University of Toronto
What is required for classification (when there is no moduli space)?

The classical notion of classification of mathematical structures depends on being able either to count the isomorphism classes, or at least to parametrize them by a reasonable space (either topological or Borel). When this cannot be done, and there are many such examples, for instance, countable groups, or countable rings, or separable C*-algebras, then one might hope, in any case, to find a functor to a simpler category—i.e., one with fewer automorphisms—which distinguishes isomorphism classes if not exactly parametrizing them. While, to form a simpler category, one cannot just identify morphisms modulo automorphisms, as this does not produce a category, it is possible to do this modulo inner automorphisms—if something like inner automorphisms exists in the category in question. Taking the closures of these equivalence classes in the topology of pointwise convergence (in the discrete topology, if there is nothing better) will then result in a well-behaved category, and a functor into it, and under modest conditions, which are satisfied for instance in the three categories mentioned above, this functor distinguishes isomorphism classes—it is a classification functor.