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Which graded algebras are the cohomology of a space?

This is an old problem sometimes called Steenrod's problem. Important examples include Hopf invariant 1 resolved by Adams and a complete solutions over the rationals by Quillen. We describe some recent progress on the problem for algebras over the integers that become (graded) exterior after tensoring with the rationals. This is joint work with Larry So and Stephen Theriault.