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A structure \mathcal{A} is said to be computably categorical on the cone above a Turing degree \mathbf{d} if, for any degree $\mathbf{c} \geq \mathbf{d}$, and any two \mathbf{c} -computable copies of \mathcal{A} , there is a \mathbf{c} -computable isomorphism between them. This condition implies that automorphism orbits of the structure \mathcal{A} are defined by formulas of low syntactic complexity. This in turn creates a natural upper bound on how hard it is to compute an isomorphism between two computable copies of \mathcal{A} . We give a structure \mathcal{A} which attains this bound, as part of a more general family of structures. This is joint work with Barbara Csima. (Received March 19, 2017)