Let $\mathfrak{g} = \mathrm{Lie}\,(G)$ be the Lie algebra of a reductive group over an algebraically closed field of characteristic $p > 0$. Then it is known that any representation of $\mathfrak{g}$ with p-character $\chi \in \mathfrak{g}^*$ has dimension divisible by $p^{d(\chi)}$, where $d(\chi)$ is one half of the dimension of the coadjoint G-orbit of χ. Humphreys' conjecture states that for every χ as above the Lie algebra $\mathfrak{g}$ admits a simple module with p-character χ whose dimension equals $p^{d(\chi)}$. In my talk I'm going to discuss the current status of this conjecture.