Abstract: For a semisimple algebraic group $G$ acting on a vector space $V$, it is rare that there is a dense $G$-orbit in the projective space $\mathbb{P}(V)$. When there is such an orbit, one can reduce the study of $G$-torsors to that of torsors under a smaller group $H$. This provides a unified view of several classical algebraic results, such as the diagonalization of symmetric matrices and Pfister’s theorems on quadratic forms of dimension $\leq 12$ in $I^3$. We describe the general situation, the case where $G$ is a spin group and $V$ is a half-spin representation, and recent work with Anne Quéguiner-Mathieu that generalizes Pfister’s theorem in dimension 12.