Let $G$ be a reductive $p$-adic group. Examples are $GL(n, F)$, $SL(n, F)$ where $n$ can be any positive integer and $F$ can be any finite extension of the field $Q_p$ of $p$-adic numbers. The smooth (or admissible) dual of $G$ is the set of equivalence classes of smooth irreducible representations of $G$. The representations are on vector spaces over the complex numbers. The smooth dual has one point for each distinct smooth irreducible representation of $G$. Within the smooth dual there are subsets known as the Bernstein components, and the smooth dual is the disjoint union of the Bernstein components. This talk will explain a conjecture due to Aubert-Baum-Plymen (ABP) which says that each Bernstein component is a complex affine variety. These affine varieties are explicitly identified as certain extended quotients. The infinitesimal character of Bernstein and the $L$-packets which appear in the local Langlands conjecture are then described from this point of view. Recent results by a number of mathematicians (e.g. V. Heiermann, M. Solleveld) provide positive evidence for ABP. (Received July 24, 2011)