18.755 tenth (and last) problem, due 12/2/14

1. Find two compact connected Lie groups $K$ and $K'$ so that

1. the Lie algebras $\mathfrak{k}$ and $\mathfrak{k}'$ are isomorphic;
2. the centers $Z(K)$ and $Z(K')$ are isomorphic;
3. the fundamental groups $\pi_1(K)$ and $\pi_1(K')$ are isomorphic, but
4. $K$ is not isomorphic to $K'$.

This is not very hard to do with a non-simple $\mathfrak{k}$, and you can get full credit for that. For a slightly more challenging question (not sure you could really do it just using things from this class) you could find an example with $\mathfrak{k}$ simple.