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Jeremy T Brazas* (jtv5@unh.edu), Kingsbury Hall, Dept. of Mathematics and Statistics,
Durham, NH 03824. *The Topological Fundamental Group and Free Topological Groups.*

The topological fundamental group π_1^{top} is a homotopy invariant finer than the usual fundamental group. It assigns to each space a quasitopological group and is discrete on spaces which admit universal covers. For an arbitrary space X , we compute the topological fundamental group of the suspension space $\Sigma(X_+)$ and find that $\pi_1^{top}(\Sigma(X_+))$ either fails to be a topological group or is the free topological group on the path component space of X . Using this computation, we provide an abundance of counterexamples to the assertion that all topological fundamental groups are topological groups. A relation to free topological groups allows us to reduce the problem of characterizing Hausdorff spaces X for which $\pi_1^{top}(\Sigma(X_+))$ is a Hausdorff topological group to some well known classification problems in topology. (Received August 11, 2010)