$\pi_1(X) = \text{trivial}$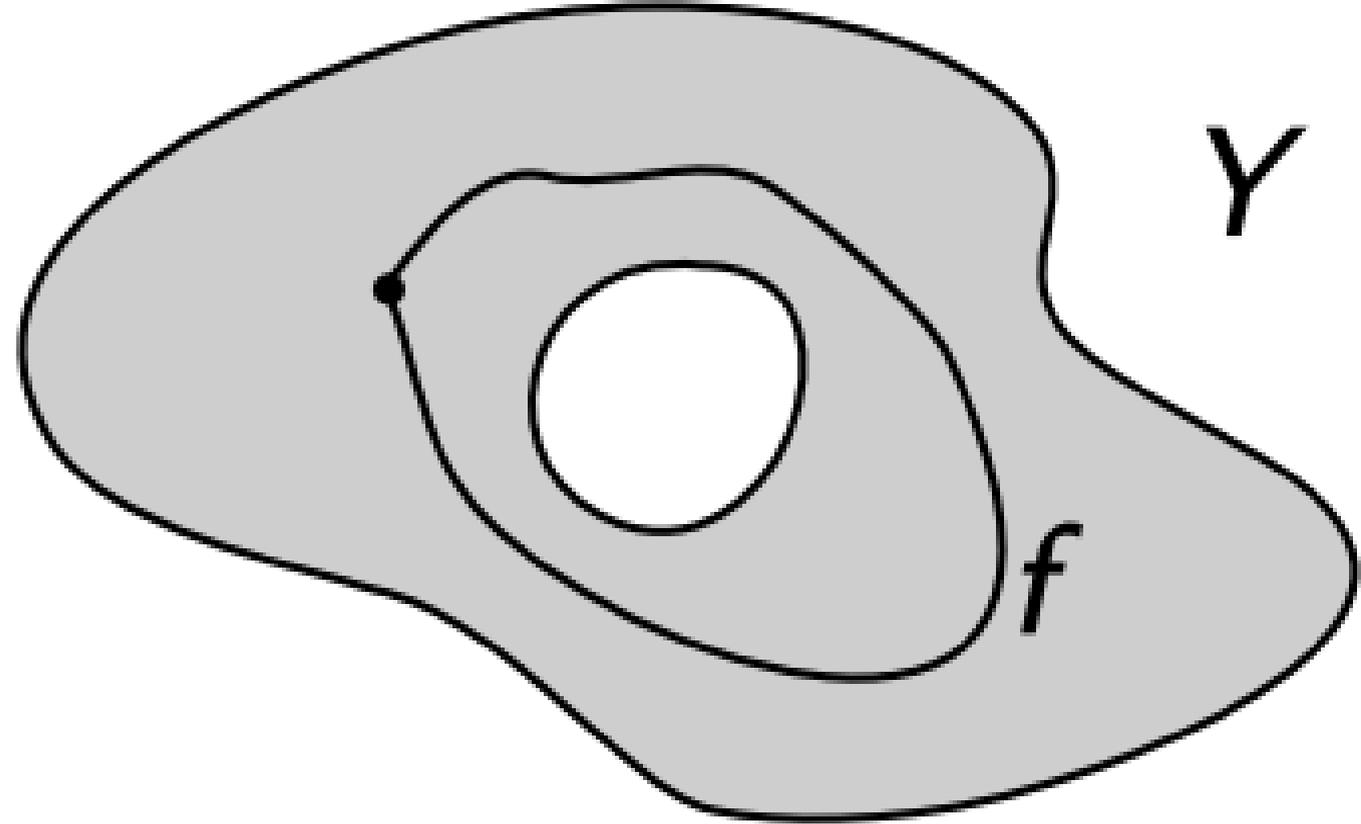 $\pi_1(Y) \neq \text{trivial}$