

of if  $\chi(X) \neq 0$  where  $X$  is homotopy equivalent to a finite complex, see [6].

Now we shall consider the lifting up to homotopy problem for oriented fibrations with fibre  $K(\pi, n)$ .

Proposition 12: Suppose we have an oriented fibration  
 $K(\pi, n) \rightarrow E \xrightarrow{p} X$  and suppose  $G$  is connected, then  $G$  lifts  
up to homotopy if and only if  $k$  is in the image of  
 $i^*: H^{n+1}(X_G; \pi) \rightarrow H^{n+1}(X; \pi)$  where  $k$  classifies  $E \xrightarrow{p} X$ .

Proof: By an argument similar to that in Proposition 9, we see that oriented fibrations are classified by  $H^{n+1}(X; \pi)$ . The condition that  $G$  is connected insures that if  $E \xrightarrow{p} X$  is the pullback of a fibration over  $X_G$ , that fibration must be oriented also and so it corresponds to a cohomology class  $\phi \in H^{n+1}(X_G; \pi)$  and  $i^*(\phi) = k$ .

We remark that the Hattori-Yoshida theorem for torus bundles may also be expressed in terms of  $i^*$ , namely there is a principal bundle lifting of  $G$  if and only if the characteristic class  $k$  is in the image of  $i^*$ . Note that we do not insist that  $G$  be connected here since the hypotheses of the Hattori-Yoshida theorem insist that the bundle over  $X_G$  be a principal torus bundle.

Proposition 12 gives an interpretation of  $i^*$  in terms of liftings. Now as a corollary to it we shall generalize