

$$\begin{array}{ccccc}
& H_n(U_i, U_i \setminus \{x_i\}) & \xrightarrow{f_*} & H_n(V, V \setminus \{y\}) & \\
& \swarrow \parallel & \downarrow k_i & \downarrow \parallel & \\
H_n(S^n, S^n \setminus \{x_i\}) & \xleftarrow{p_i} & H_n(S^n, S^n \setminus \{f^{-1}(y)\}) & \xrightarrow{f_*} & H_n(S^n, S^n \setminus \{y\}) \\
& \nwarrow \parallel & \uparrow j & \uparrow \parallel & \\
& H_n(S^n) & \xrightarrow{f_*} & H_n(S^n) &
\end{array}$$