962-55-709 **William Browder*** (browder@math.princeton.edu). *Constructing group actions.*
Given a CW complex Y of dimension n,1-connected, how may one construct free actions of a group G on finite dimensional spaces of the homotopy type of Y? In particular, how large a portion of the Postnikov tower of a space is necessary to describe an n-dimensional space with fundamental group G? Let $f : Y \to Y(n+1)$ be the term of the Postnikov tower, so that f induces isomorphism on π_k for $k \leq n+1$ and $\pi_k(Y(n+1)) = 0$ for $k > n+1$. Theorem: Suppose that the finite group G acts freely on $Y(n+1)$ with quotient $Z(n+1)$ such that the cohomology groups $H^{n+1}(Z(n+1); A) = 0$ for coefficient systems $A = F_pG/K$ for all primes p and all p-subgroups K of G. Then there exists a Z of dimension less than or equal to n, such that $Z(n+1)$ is the $(n+1)$st term of the Postnikov tower for Z, and such that its universal cover is homotopy equivalent to Y. This makes possible the construction of many strange group actions on ordinary spaces, extending the ideas of my paper: Homologically exotic group actions (to appear in the birthday volume for Jim Milgram). One may show that the homological dimension of Z (with F_p coefficients) is the same as that of Y. (Received September 22, 2000)