1038-37-307 **Suzanne Hruska** and **Rodrigo A Perez***, LD-224R IUPUI, 402 N. Blackford St., Indianapolis, IN 46202, and **John Smillie**. *Homotopy Pseudo-Orbits and Iterated Monodromy Groups (Part I).* Preliminary report.

Let f be a map on a manifold M, Λ an invariant set, and U a neighborhood of Λ on which f is expanding. Yutaka Ishii and John Smillie have shown that the homotopy type of f restricted to U determines f restricted to Λ up to topological conjugacy. Their technique is to build models for the dynamical systems using homotopy pseudo orbits (HPO), establish a shadowing theorem for HPOs, and show that a suitable notion of homotopy equivalence between models establishes topological conjugacy of the original systems.

If U is connected, Nekrashevych's theory of Iterated Monodromy Groups (IMG) provides a combinatorial model of Λ determined by the action of its fundamental group on the set of f-preimages of a base point. The IMG approach to Dynamical Systems has proven very successful, but it is still seen as an essentially algebraic construct.

In order to translate the tools of IMGs into a classical dynamical language, we will describe the relationship between Ishii-Smillie HPOs and Nekrashevych IMGs, and show how HPO models can generalize the IMG construction when U is not connected. This relationship will be illustrated with concrete examples of rational maps. This is joint work between S. Hruska, R. Perez, and J. Smillie. (Received February 12, 2008)