

**Meeting:** 1001, Evanston, Illinois, GHRIST, Invited Address

1001-68-396      **Robert Ghrist\*** ([ghrist@math.uiuc.edu](mailto:ghrist@math.uiuc.edu)). *The geometry and topology of reconfiguration.*

There exist a variety of reconfiguration problems — in robotics, biology, computer science, combinatorics, and related contexts — in which local rules must be coordinated to effect global changes in system states. We define for any such reconfigurable system a cubical complex (the *state complex*) which coordinates simultaneous local moves.

Perspectives from geometric group theory are extremely relevant to these physical settings. There is a strong relationship between locally defined reconfigurable systems and spaces of *nonpositive curvature*; this in turn has implications to the existence and computation of optimal solutions to state-planning problems.

The talk will be rich with examples and will assume no background in either robotics or in geometric group theory. (Received August 31, 2004)