998-55-100 **Ryan Budney*** (`rybu@math.rochester.edu`), Department of Mathematics, Hylan Building, University of Rochester, Rochester, NY 14627. *What is the homotopy type of the space of long knots in R^3? or the space of closed knots in S^3?* Preliminary report.

The space of long knots in R^3 is the space of embeddings $R \to R^3$ which are standard outside of $[-1, 1]$. We denote the space of long knots by K. I will describe a result which states that K has the homotopy type of a free little 2-cubes object, free over $K_p \cup \{*\}$ where K_p is the space of long knots which are prime and $\{*\}$ is a disjoint basepoint. I will also describe current (at present incomplete) work on the homotopy-type of K_p. The homotopy type of K_p ultimately depends on the Jaco-Shalen-Johannson decomposition of knot complements, which is in turn intricately related to 3-dimensional hyperbolic geometry by the work of Thurston. This ultimately leads to a recursive description of the homotopy type of K_p in terms of 1) objects which are free over the little 2-cubes operad, 2) trivial circle bundles and 3) certain twisted bundles over tori, whose monodromy depends intimately on actions of isometry groups of certain hyperbolic link complements. (Received February 16, 2004)

1