963-53-140 **Eddie Fuller*** (ef@math.duke.edu), Department of Mathematics, Duke University, Box 90320, Durham, NC 27708-0320. *Constructing Knot Isotopies with Geometric Constraints Using Holonomic Space Curves.*

Many invariants of knots can be computed from their planar diagrams. The geometric properties of knots are more subtle and don't necessarily follow the geometric structure of the planar diagram, however. In this talk, a method for studying the geometry of space curves using their planar projections is presented. Space curves parametrized by $(-f, f', -f'')$ for a periodic function $f : \mathbb{R} \to \mathbb{R}$ are called holonomic and were shown by Vassiliev to represent all knot types. By passing to the holonomic representative of a given knot type and using the planar diagrams of a holonomic isotopy, we can study the geometry of the curves within the given knot type explicitly. This is accomplished by developing a calculus of planar diagrams that describes the knot isotopy while keeping track of the geometric properties of the space curves in the isotopy. Consequently, it would be useful to have an algorithm for producing holonomic knots within specified knot types and some preliminary results in this effort are also presented. (Received January 21, 2001)