1116-53-1735 **Andrew Osten Hoffman*** (hoffmaao@stolaf.edu), 1500 St. Olaf Ave., Northfield, MN 99362, Northfield, MN 55057, and **Joe Benson**. *Invariants under the Poincare transformation and their corresponding evolution equations.* Preliminary report.

Although the partial differential equations that exhibit soliton behavior and their solutions have been well studied in the past decades, the underlying reasons why the known soliton equations are unique has remained unclear. Especially curious, is the ability to generate these partial differential equations from invariant curve evolutions under various lie group actions. The purpose of this study is to first identify differential invariants of curves under the Poincare group action and then analyze the evolution of these invariants under invariant curve flows in two-, three-, and four-dimensional Minkowski space. We construct differential invariants using the equivariant method of moving frames and the induced invariant variational bicomplex. We then study the corresponding curvature evolution equations of Poincare group actions on Minkowski space and link the systems to integrable soliton dynamics. We found that the differential invariants and evolution equations are very similar to the two-dimensional and three-dimensional Euclidean cases and that both have corresponding recursion operators. (Received September 21, 2015)