1089-57-367 **Carla Farsi**, University of Colorado at Boulder, Department of Mathematics, Campus Box 395, Boulder, CO 80309-0395, **Markus Pflaum**, University of Colorado at Boulder, Department of Mathematics, Campus Box 395, Boulder, CO 80309-0395, and **Christopher Seaton*** (seatonc@rhodes.edu), Rhodes College, Mathematics and Computer Science Department, 2000 N. Parkway, Memphis, TN 38112. *The inertia space associated to a proper Lie group action as a stratified space.*

Let G be a compact Lie group and let M be a smooth G-manifold. If G happens to act locally freely on M, then the quotient of M by the G-action is an example of an orbifold. In the study of the geometry of orbifolds, an object called the inertia orbifold has played a major role. The inertia orbifold is a disjoint union of orbifolds given by the quotient of the space of loops of the translation groupoid, a smooth manifold, by a natural action of the translation groupoid itself.

If the action of G is not assumed to be locally free, then the space of loops of the translation groupoid is no longer a smooth manifold, and the quotient is no longer an orbifold. In this case, we refer to the quotient of the space of loops as the inertia space of the G-manifold M. We will describe an explicit Whitney stratification of the inertia space. Using this stratification, we will present a de Rham theorem for cohomology of differential forms on the inertia space with respect to this stratification. (Received February 19, 2013)