1050-46-132　　　　　**Marta Lewicka**, **Maria Giovanna Mora** and **Reza Pakzad***, Department of Mathematics, Univeristy of Pittsburgh, Pittsburgh, PA 15232. *Rigidity and density of smooth mappings in Sobolev spaces of isometries.*

The Sobolev spaces of isometries and infinitesimal isometries on surfaces arise in the context of nonlinear elasticity. In this talk, we will discuss the space of $W^{2,n}$ isometries of a flat domain $\Omega \subset \mathbb{R}^n$ into $\mathbb{R}^{n+1}$ and the space of $W^{2,2}$ first order infinitesimal isometries on a convex shell in $\mathbb{R}^3$. Our recent results show that the rigidity results known for smooth isometries still hold true for these classes of mappings. Also, we are able to show that smooth mappings are dense in the above spaces of Sobolev isometries. These questions remain unanswered in various other situations. (Received March 02, 2009)