1108-43-355   **Xiaoyue Cui*** (`xiaoyue@wayne.edu`), 4417 2nd Avenue, Apt. 101, Detroit, MI 48201. *New characterizations of the second order Sobolev spaces in Euclidean spaces.*

The theory of Sobolev spaces plays an important role in applications to partial differential equations, geometric analysis, harmonic analysis, complex analysis, etc. The main purpose of this talk is to establish some new characterizations of the second order Sobolev spaces in Euclidean spaces. I will present the characterizations by two different types: by the second order difference, by the Taylor remainder of first order and by the differences of the first order gradient. Such characterizations are inspired by the works of H.M. Nguyen and Bourgain, Brezis and Mironescu on characterizations of first order Sobolev spaces in the Euclidean space. (Received January 18, 2015)