1106-35-2266 **Ramesh Karki*** (rkarki@rockets.utoledo.edu), 918 Winding Ridge Drive, Apt 8, Richmond, IN. *Nonlinear Pseudo-differential Equations, Sobolev Gradients & Application to Nonlinear Pseudo-differential Equations.*

We are driven by a problem of finding critical points of an energy type funtional defined on an infinite dimensional Hilbert space (namely a Sobolev Space). To set up such problem, we first consider Sobolev gradient of such funtional as an element of a Sobolev space $H^{\alpha\beta},\ \alpha \in (0,1],\ \beta \in (0,1)$, then consider the steepest descent (Sobolev gradient descent) equation. Under suitable initial and periodic boundary conditions, we prove existence and uniqueness of semi-flow of this equation and discuss its equilibrium solutions, which are indeed critical points of the functional. (Received September 16, 2014)