

Meeting: 1005, Newark, Delaware, SS 10A, Special Session on Symmetry Methods for Partial Differential Equations

1005-35-115 **Samer S Ashhab*** (aasamer@math.uno.edu), Math Dept., University of New Orleans Lakefront,
New Orleans, LA 70148. *Canonical Transformations and Hamiltonian Evolutionary Systems.*

Associated with a Hamiltonian evolutionary system is a Hamiltonian differential operator. This Hamiltonian differential operator determines a Poisson bracket on the space of local functionals. We find necessary and sufficient conditions for a transformation on the space of local functionals to be canonical, i.e., preserving for the Poisson bracket. We consider three different cases that depend on the dimension of the vector bundle of the theory and the associated Hamiltonian differential operator. We show how a canonical transformation transforms the Hamiltonian evolutionary system and its conservation laws and illustrate these ideas with a few examples. (Received February 02, 2005)