1145-65-419 **Qingguo Hong*** (huq11@psu.edu), **Shuonan Wu** (sxw58@psu.edu) and **Jinchao Xu** (xu@math.psu.edu). *Extended Galerkin Method.*

In this talk, we present an extended Galerkin (XG) method for the second order elliptic problems. The proposed method has four primal variables — $\boldsymbol{p}_h, \hat{p}_h, u_h, \hat{u}_h$ that contain all the possible variables in most of the existing FEMs. Therefore, it has the flexibility to cover most of the existing FEMs. In particular, we can obtain the hybrid discontinuous Galerkin (HDG) method and weak Galerkin (WG) method from the proposed formulation and further show that they are both equivalent to a special discontinuous Galerkin method. In addition, we then study two types of uniform inf-sup conditions for the proposed method, by which the well-posedness of the various FEMs follows naturally. (Received September 05, 2018)