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**Junping Wang\*** (jwang@nsf.gov), National Science Foundation, 2415 Eisenhower Avenue, Alexandria, VA 22314. *The Basic Principles and Recent Developments of Weak Galerkin Finite Element Methods.*

This talk will introduce the basic principles and some recent developments in weak Galerkin finite element methods for PDEs. The topics to be discussed are: (1) basic concepts of discrete weak differential operators, (2) weak continuity through the use of stabilizers, (3) discretization techniques via constrained minimization, (4) weak Galerkin algorithms for some typical PDEs, (5) numerical integration on general polytope, (6) superconvergence and discrete maximum principles for weak Galerkin approximations, and (7)  $W^{2,p}$  theory in weak Galerkin FEM. (Received September 10, 2018)