

1067-AA-1306      **Veronika Pillwein\*** (vpillwei@risc.jku.at), Joh. Kepler University, Altenbergerstr. 69, 4040  
Linz, Austria. *Special Functions and High Order Finite Element Methods.*

High order finite element methods are a widely used tool to solve systems of partial differential equations numerically. Starting from the variational formulation of a system, the approximate solution is sought as an expansion in terms of polynomial basis functions that are often built as combinations of orthogonal polynomials. In the design and analysis of these basis functions several properties of orthogonal polynomials are exploited, many of which can be proved and discovered using symbolic algorithms. In this talk, we will survey some of the recent results we obtained in this area. (Received September 20, 2010)