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**Larry Rolen\*** ([larry.rolen@vanderbilt.edu](mailto:larry.rolen@vanderbilt.edu)), Department of Mathematics, 1420 Stevenson Center, Vanderbilt University, Nashville, TN 37240. *Riemann Hypothesis for Period Polynomials and their Analogues.*

Recently, a number of authors, including El-Guindy and Raji, Conrey, Farmer, and Imamoglu, and Jin, Ma, Ono, and Soundararajan (JMOS) have studied the roots of period polynomials. These polynomials have a distinguished history, and arise naturally from Eichler-Shimura theory and the study of critical L-values of modular forms. JMOS proved the so-called "Riemann Hypothesis for Period Polynomials" (RHPP), which states that all roots of these polynomials, in the case of Hecke eigenforms, line up on the natural line of symmetry, namely, the unit circle. In this talk, I will discuss further analogues, conjectural and proven, for this phenomenon. In particular, describing joint work with Diamantis, I will describe a recent probe into period polynomials for "higher L-derivative" period polynomials which we have described a cohomological theory for and formulated several conjectures on. I will also discuss forthcoming work with Babei and Wagner, where we prove that the RHPP holds for a large class of Hilbert modular forms using a newly formulated notion of period polynomials. Time permitting, we will discuss further experimental data on a much broader phenomenon, which will serve as jumping off points for future investigations. (Received January 21, 2020)